Rubber Journal and International Plastics

VOL. 138 NO. 9 FEBRUARY 27 1960 Price 1s. Weekly

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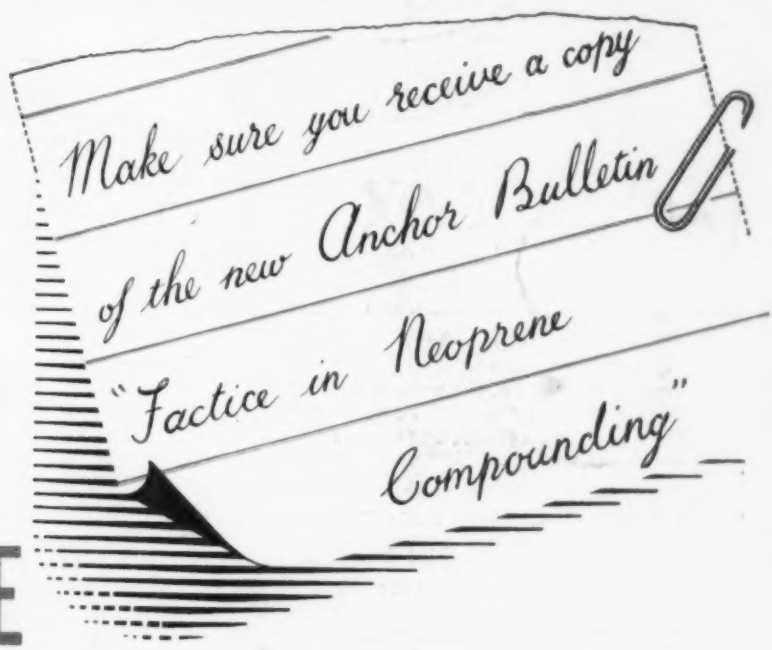

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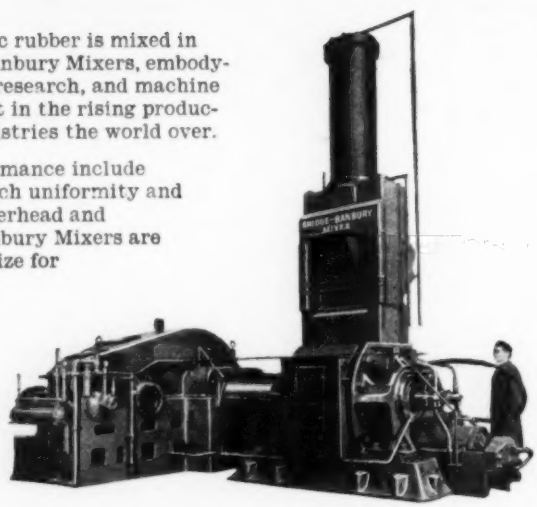

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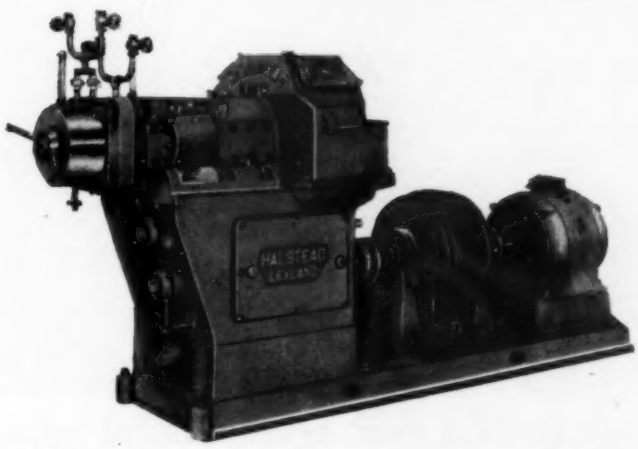

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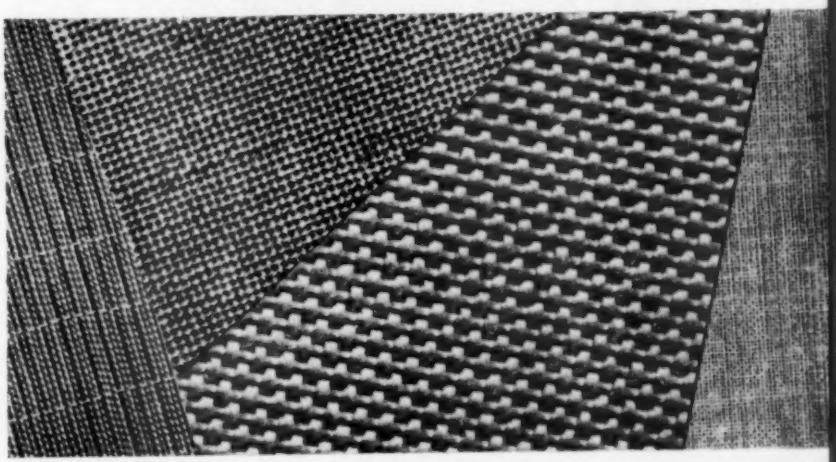

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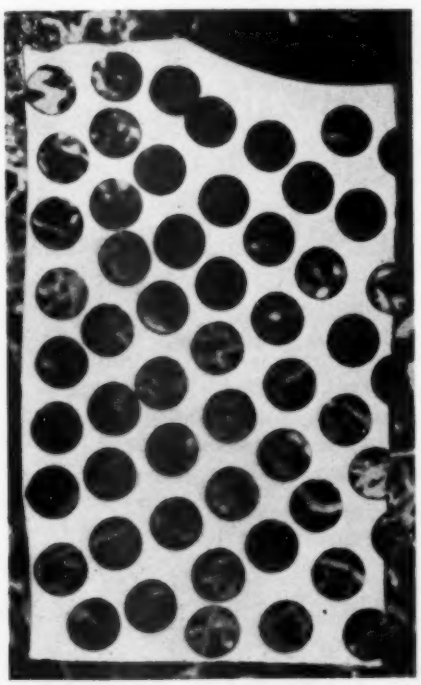

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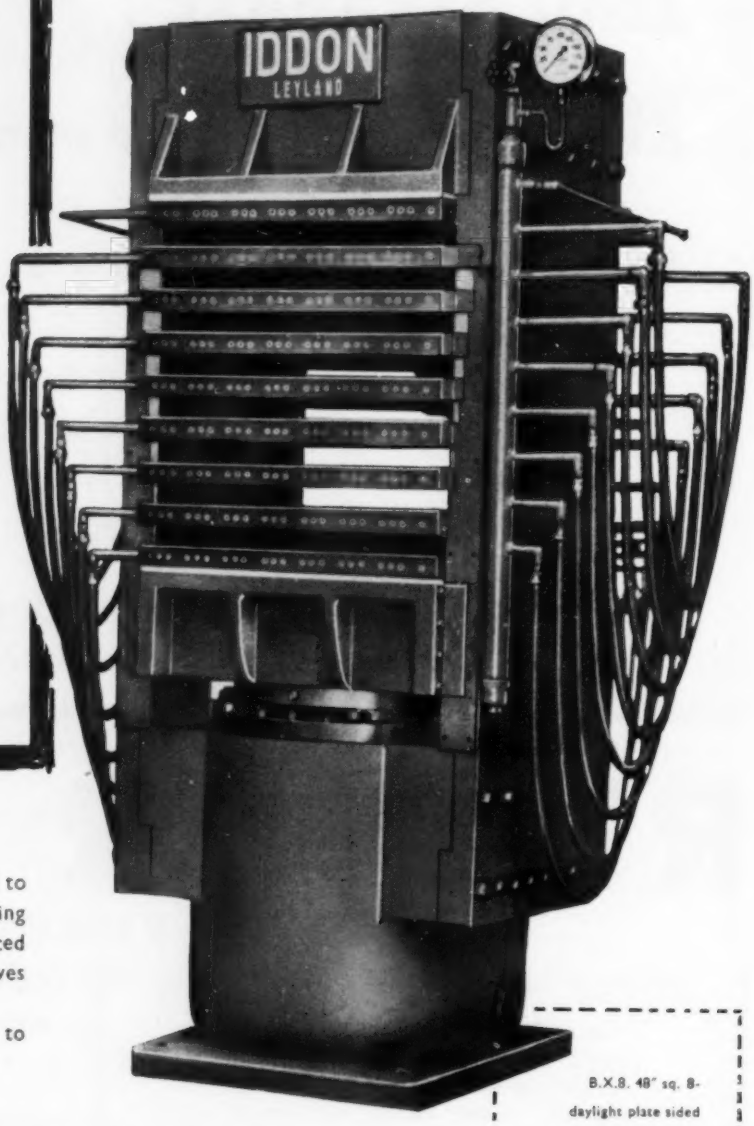

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IN ITS 76th YEAR

February 27 1960

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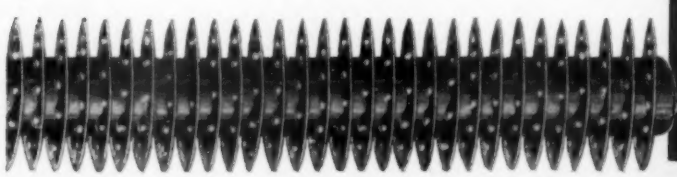

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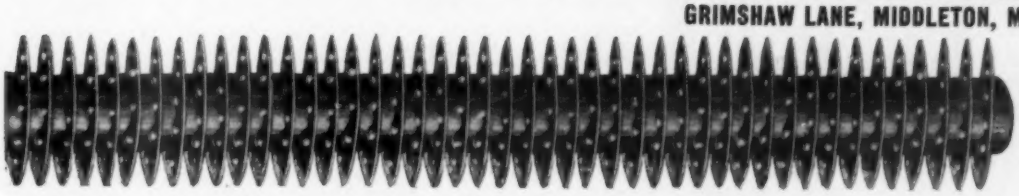

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NOTES of the WEEK

Scientific Management

MANAGEMENT is becoming increasingly recognized as an art or even, perhaps, as a science. Certainly there can be no doubt that management, and the good manager, will play a steadily growing and more important part in industry, and in international industrial relations, in the years to come. Last week, Mr Reay Geddes, managing director of the Dunlop Rubber Company, making a television appearance on the BBC Brains Trust, gave some competent answers to questions concerning management. Then, last Tuesday in Sydney, Australia, Lord Baillieu, president of the British Institute of Management and president of the Dunlop Rubber Company, spoke at the opening session of the International Congress of Scientific Management, his subject, ' The Next Ten Years in Management '. What Lord Baillieu said should be read in its entirety for it is an important contribution to what is, indeed, a vital matter. Here it is possible only to summarize his address.

Sense of Urgency

AFTER commenting briefly on the political, economic and social developments since the beginning of the century, Lord Baillieu spoke of the next decade. ' I think one of our working assumptions should be that there will be no major war during the period and, another, that the present situation whereby the world is divided into two major groups—the communist and non-communist—will continue, but that there will be ever-growing contact and intercourse, and a pattern of co-existence, leading, let us hope, to inter-dependence between the groups '. The dominating feature of the next decade, said Lord Baillieu, would be the assertion of all peoples in the newly-developing countries of their claim to a greater share of the world's goods. They would want to achieve the break-through from their present stage of poverty during the span of the present generation. Modern management in the broadest sense should take account of these new and very striking forces. ' A dominating factor of the next decade', he said, 'will be the rate of application of new knowledge in the scientific and technical fields.'

On the meaning to management of the facts and assumptions he mentioned, Lord Baillieu said, ' I think we may conclude that, during the next decade, there will be throughout industry: a greater willingness to face or induce competition or change; a surer basis for thinking ahead, with a great confidence in growth; a much greater need for forward planning because of the increased rate of introduction of new scientific knowledge. Management should therefore go forward into the next decade with confidence and a sense of urgency'. It would be seen, said Lord Baillieu, that there would be a very large number of new and quite different opportunities in the 60's and 70's. If full advantage was to be taken of opportunities as they occurred, managers must be ready and prepared to attack.

Education and Training

ON education and training for management, Lord Baillieu said: ' There is no doubt that during the next decade greater attention will need to be paid to this problem. The development of modern industry has turned, in the main, on the subdivision of activities and the ever-growing specialization of more and more sub-divided aspects. This has had two consequences: on the one hand, success now turns much more on the correct marshalling of a greater number of specialized activities than on brilliance in any or all of them individually; in other words, general management. On the other hand, the lower positions of managerial responsibility are mostly concerned with one or other of the specialized activities and, hence, are not the natural training-ground they used to be for developing the skill and knowledge required for general management. The position is, therefore, that the importance of competence in general management has increased, but the development no longer follows naturally, as it used to do from experience in the lower ranks'.

Responsibility

ON responsibility, Lord Baillieu said that greater understanding led on to the widen ingresponsibilities which would have to be borne by management in the years ahead. ' No other fact of existence is so important to the average worker than the content of the job itself and its continuing security, the kind of boss he has, and the values that are expressed in his working relationships. Yet specialization of labour, and the manner in which assembly-line jobs have been engineered, tend to segment work and make it less worthy; the sense of craftmanship is in danger of being lost. The individual labour contract has given way to impersonal collective bargaining. . . . The process of working has lost much of its meaning and only the end product and the pay packets seem to count '. The speaker went on to say that the individual worker's recognition of his dependence on the company resulted in feelings of personal insecurity. In these circumstances, the company inevitably took on more and more social security functions. Management, in co-operation with labour, must seek to preserve the pride of craftmanship, the sense of independence, and of dedication in the operation of industry.

NEWS *Briefs*

MONSANTO'S SALES UP—INDO-GERMAN TALKS DUPONT CUT HYPALON PRICES—ISRAEL TAX UP AUSTRALIAN PVC PLANT—BORNEO REPLANTING

●**Turkey**—The first list of import allocations in 1960—the fourth list since 1958—was published in the Turkish Official Gazette of February 15. The new list raises the level of liberalization to 54%. Allocations include $2.5m. for the import of raw rubber and $20.176m. for the import of lorries, trucks, station wagons and other vehicles.

●**Borneo**—The Antara news agency has reported that the Indonesian Peoples Rubber Bureau plan to sponsor the replanting of more than 20,000 acres of rubber in South Borneo during this year. The agency said the replanting programme was started in 1958 and by 1965 the Bureau hoped to have 120,000 acres under new growth in South Borneo. At present, many trees in the province were nearly 30 years old.

●**Germany**—The increase in the price of phenolic moulding powders made by West German manufacturers (*RJIP*, February 20) has now been reduced to 4%.

●**Indonesia**—Djakarta brokers said on February 20 that the latest Indonesian Government export regulations had sent rubber prices in the capital tumbling down by up to 13 rupiahs per kilogram in the past few days. Last Saturday's closing price for top grade was 40 rupiahs compared with around 53 a few days previously. The regulations are that exporters must state to the Government what foreign money they have overseas and show their taxation figures for last year. If they fail to do this, they will not be given export licences.

●**Australia**—A new £A2m. polyvinyl chloride plant is being constructed at Altona, Victoria, by B. F. Goodrich, in combination with C.S.R. Chemicals of Sydney. This is part of a £A28m. chemical development at Altona; production is scheduled for 1961.

●**Ceylon**—Russia has re-entered the Colombo sheet rubber market. She acted through Ceylonese agents, and her action bumped up the price for ribbed smoked sheet No. 1 by 2 cents lb.

●**United Kingdom**—Work is back to normal at Dunlop's Liverpool factory, after the twelve-day strike of 450 maintenance engineers, who demanded substantial pay increases in connexion with a bonus scheme. Management and engineers were understood to have reached agreement on February 21.

●**Malaya** — The USSR and Soviet bloc countries bought 203,000 tons, or 18.3% of the rubber exported from Malaya, in the January-November period of 1959, it was officially reported in Kuala Lumpur.

●**United States**—The Dupont Company has cut the price of Hypalon in reductions ranging from 10 to 23 cents per lb., according to type, the most commonly used type, Hypalon 20, dropping from 70 to 47 cents a lb. The new prices will be effective from March 1.

●**Israeli**—New regulations issued by the Israeli Treasury provide for considerable increases in customs excise and purchase tax on a variety of goods, including rubber. In some cases the increases exceed 100%.

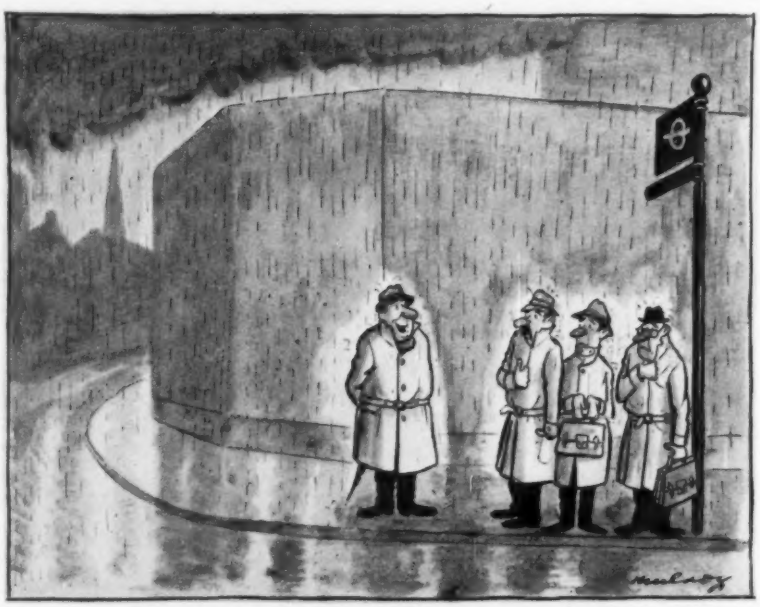
●**East Germany**—An order for the design and detailed engineering of an ethylene plant with a 40,000 tons annual capacity has gone to two UK firms. The two firms, Humphreys and Glasgow and Petrocarbon Developments have signed a contract for this with the foreign trade corporation 'Dia-Chemieausrüstungen.' The first phase of the plant is due for completion by December 1962. East Germany is likely to place further contracts with UK firms.

●**Switzerland** — Geneva has been chosen as the headquarters of the secretariat of the Outer Seven. Official confirmation came this week, after a meeting of officials from Britain and the other six member countries in Paris.

●**United States** — Authorized capital expenditures of the Goodyear Tyre and Rubber Company for 1960 total $90m. compared with expenditures of 55,640,633 dollars out of $78m. authorized in 1959.

●**United Kingdom** — Monsanto Chemicals announced an upsurge in group net profit from £1,016,274 to £1,693,266 in 1959. Sales were a record £18,427,505. The chairman, Sir Miles Thomas, said that the Fawley polythene plant which had been completed to plan, was running smoothly.

●**India** — Herr Von Brentano, the Federal German foreign minister, said that talks in Dehli had been mainly on economic aspects. Germany may finance a number of industrial projects relevant to India's third five-year plan.



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PART IV—FILM

(Continued from February 20 issue, page 276)

By L. HINDS, Ph.D., B.Sc., A.R.C.S. (I.C.I. Ltd.)

THE introduction of polythene film in this country in 1948 was recognized very quickly by the public as an important step forward in packaging, and today 30% of the total consumption of polythene in the UK is in film. Polythene film seems to have missed altogether the early difficulties which have beset the introduction of so many other plastics applications; it has never been regarded as a substitute and from the beginning it was welcomed as being outstandingly useful. Its haziness and softness were accepted without comment, the novelty of the properties of the film itself being a sufficient attraction; as the public became accustomed to the film and as new applications developed in packaging and in building and agriculture it became necessary to modify some of the properties of the film; this was done at the stage of polymer manufacture and by modifications of the extrusion process. It is now well appreciated by users and potential users of film that it is possible by manipulation of these two processes to produce a large variety of film properties, and the position is now that the variety of requirements of the trade seems to increase almost from week to week.

MANUFACTURE

Polythene film can be made commercially by two processes, the tubular film 'bubble' process and the flat-film slot-die process.

Tubular Film

In the tubular-film process (Fig. 6) the melt is extruded through an annular die, cooled by passage through an air stream, nipped between rollers, and reeled-up. By introducing air through the die-torpedo into the tube of film, this can be expanded to two or three times the diameter of the die. Thus, within limits, many different widths of film can be obtained from the same die. By varying the speed of the rollers closing the end of the bubble (the nip-rollers) the amount of longitudinal stretching can be varied, and this is normally used to adjust the thickness of the film to the required value. The advantages of the process are several: with only one die a range of film widths and thicknesses can be produced at will, a bag can be produced by only one heat seal and two cuts, and very wide film can be produced (by slitting the tube) with equipment wide enough to handle only half this width. On the other hand a drawback of the process is that the rate of cooling of the film is rather low particularly if air-cooling is used.

At high output rates there are difficulties of controlling bubble movements sufficiently to keep film thickness between close limits. Further, because the film is nipped between two rollers at one end of the bubble, the film temperature at this point must be sufficiently low to prevent 'blocking' ('blocking' is the term used to describe the sticking together of the opposite inner surfaces of the film). The use of additives to prevent blocking can allow greater production speeds to be attained and improvements in the haul-off techniques have given better control over the swaying and shaking of the bubble.

As competition between film manufacturers increases, the cooling rate is becoming the limiting factor on the whole process, and in this respect the process compares unfavourably with the slot-die process; also, with air-cooling it is not possible to use shock-cooling and high extrusion temperatures to effect a reduction in haze, as is possible with other processes.

Flat Film

In the slot-die process (Figs. 7 and 7a) the melt is extruded from a straight slot-die either directly into a cooling water-bath or onto water-cooled steel rollers. The film is stretched longitudinally between the die and the cooling-bath or rollers, to the required thickness. Chilled steel rollers are preferred to a water-bath if the film contains hydrophilic materials such as anti-static agents, which cause some wetting of the film, with subsequent drying difficulties. Chilled rolls also allow greater production speeds than a water-bath.

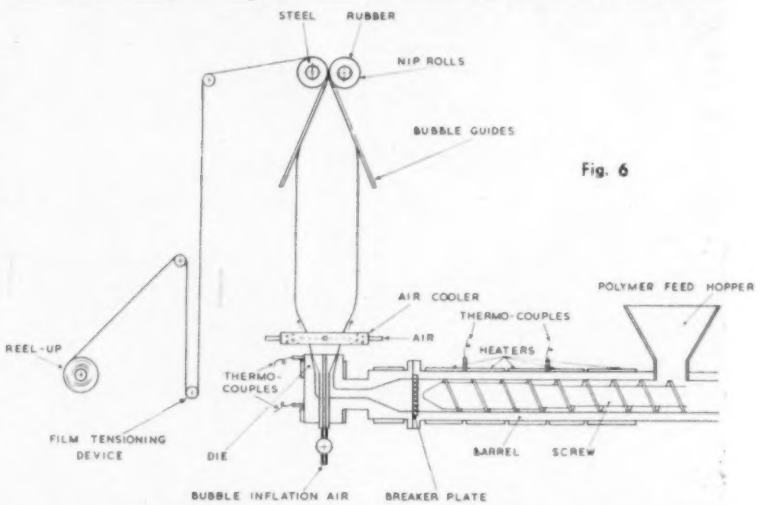


Fig. 6

The production of packaging bags from flat film requires special machinery to effect sealing of the sides of the bag as well as the bottom; such machinery has recently been introduced into this country.

As the market demand for less hazy film increases it is expected that a greater proportion of film will be manufactured by the slot-die process in which, under suitable extrusion conditions, a considerable reduction in haze can be obtained by shock-cooling. This is not possible in the tubular-film process except by friction contact with water-cooled metal with the consequent marking of the film.

MARKET DEVELOPMENT

In a market that has trebled in the last four years and is still expanding very fast, it is difficult to keep pace with the day-to-day developments and even more difficult to predict the turn of events in the future.

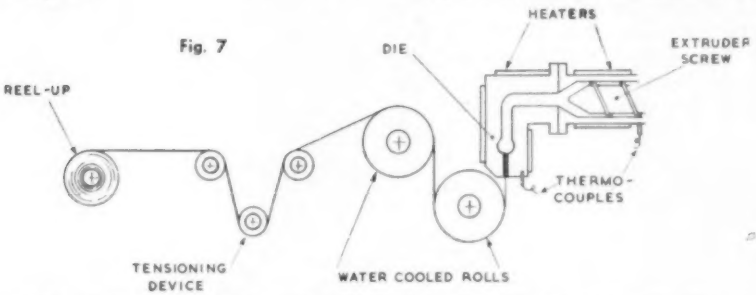
The commercial outlets for film are determined by the properties of the film available and a consideration of

these properties and of how they can be modified is a good indication of the possibilities of expansion in the film market.

Toughness, Apparent Brittleness

The toughness of film is its most important feature in the packaging of potatoes, carrots, etc., and for agricultural and building applications; for these uses the haziness of the film is not of great importance and as toughness and haze are to a certain extent mutually exclusive, hazy film has been accepted.

Fig. 7



The tensile strength of the film is, as expected, mainly dependent on melt flow index but the apparent brittleness depends mainly on the density of the polymer, the higher the density the more brittle being the film. Brittleness depends also partly on the conditions of extrusion of the film.

'Brittleness' of film should not be mistaken for the kind of brittleness encountered in mouldings; examination of a 'brittle' tear does not show a sharp fracture but reveals a narrow edge of stretched film. A 'brittle' film requires much less energy to tear than does a 'non-brittle' one because a smaller area of film is stretched before the tear occurs. If the stretching is highly localized a 'brittle' tear occurs; if the stretching is distributed over an area, a 'non-brittle' tear results. 'Brittle' tears are more likely to occur if the tearing stress is applied at high speed, such as in an impact, and film is normally tested under such conditions.

Haze

Haze in film was formerly accepted as one of the unavoidable properties of polythene but it has been shown that commercially available polymers of slightly higher density than the normal 0.918g./c.c. give film of lower haze. The higher density of these materials results in a greater susceptibility to 'brittle' tearing, other things being equal, and in greater gloss, clarity and stiffness.

Haze is of two kinds: surface roughness caused by melt flow phenomena, and surface roughness and internal optical irregularities caused by crystallization. The faster the film cools between the extrusion die and the freezing point, the less is the haze resulting from crystallization, and the greater is that resulting from flow, and in higher density polythenes in which the haze caused by crystallinity is dominant, shock-cooling can be used to produce almost haze-free film.

In soft-goods packaging, haze in the film dulls the colour of the packed article as seen through the film, and much of the sales appeal of using a transparent package is lost. Provided adequate toughness is retained film of the lowest possible haze is required for this market.

Gloss

Since it has been found that small increases in the density of polymers could result in better gloss, the packaging market has demanded this property in order to add sparkle to the package. However, it has been suggested that too much gloss may destroy some of the appeal of a package by reflecting too much of the shop's lighting and of the variously-coloured goods in the vicinity.

Clarity

Clarity of polythene film is defined as the property which allows objects at a distance from the film to be seen through it without distortion. Clarity must not be confused with freedom from haze; the presence of haze interferes with the measurement of clarity but the two properties themselves are quite separate. In packaging, the object observed through the film is touching the film or at a very short distance from it and only large differences in clarity are noticeable. Although in some applications clarity is of importance, in packaging it can virtually be discounted.

Stiffness

As the density of polythene increases, so does also its rigidity. Film made from high density polythene is stiffer in both handling and appearance. In over-wrapping machines designed to handle stiff 'Cellophane' or paper a stiffness exceeding some minimum value may be essential.

Blocking

Although not strictly a property of the film itself, blocking during the manufacture of tubular film is one of the most serious limitations on the high-speed production of film by this process. With higher density polymers blocking is a less serious limitation because the increased rigidity of the film prevents the intimate contact obtained between flexible films.

Market Prospects

Only a few years ago, applications requiring polymers with a low haze value or high toughness were considered in this country to be speciality applications and the greater part of the film produced had neither of these two attributes. Recently, however, the two speciality polymers have grown in importance as new applications created a demand for them, and the general-purpose material has maintained its position without much change. The low-haze film is finding increasing applications in the packaging of woollens, lingerie and many other soft goods; the tough film is finding a large outlet in agriculture and building industries and in industrial packaging.

The future is bright for film, there being no sign yet of market saturation in the existing applications. Three and four colour printing with good register is now possible on polythene film, greatly increasing the appeal of some types of retail packaging. In addition to this, three applications (new to this country) are claiming the attention of film manufacturers. The first is bread-wrapping; here the potential for film is thought to be almost half of the present sales, and once established the demand for film is not likely to be susceptible to fluctuation. It is envisaged that this application will require non-hazy film of a rigidity which is sufficiently high to enable the existing bread-wrapping machines to function satisfactorily. The low haze and competitive price required may eventually be obtained by the introduction into this country of high-speed flat-film machinery with chilled steel rollers for shock-cooling the film.

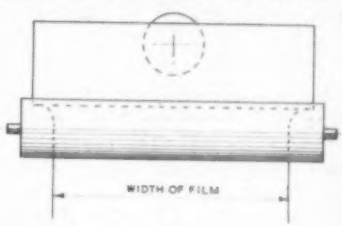


Fig. 7A

The second new application is the

packaging of dry-cleaned clothes in large bags often called ' garment bags ' —which have had a very considerable success in the USA. The potential market for this application is thought to be only about a quarter of the size of the bread-wrapping one, and the requirements of the application are likely to be low-haze film of rather thinner gauge than the normal 100 to 150 gauge (0.001 to 0.0015in.); 50 to 75 gauge film is being used in the USA and improvements in the handling techniques have enabled this film to be processed without too much difficulty. Film of such a gauge is expected eventually to fulfil most of the requirements of the market in this country.

At the present time dry heavy chemicals, fertilizers, plastics, etc., are packaged mainly in paper sacks. Polythene is sometimes used as a coating on the paper or as a liner if the ingress of water through the paper can be harmful to the contents of the sack. In the USA it has been found to be an economic possibility to make sacks entirely from tough polythene film with a thickness of 0.0075 to 0.010in.; because of this large thickness this application could result in a very large outlet for polythene.

Polythene film in which haze is so slight as to be negligible is fast becoming a strong competitor to regenerated cellulose films. The annual consumption of this type of cellulose film in this country is about 35,000 tons, which is very much higher than the consumption of polythene film. With the advantage of water-resistance it seems likely that polythene film will take at least some of this market.

It is difficult to predict entirely new applications for polythene film but the recent success of its use in large outdoor applications such as road-building, water reservoir lining, agriculture, etc., suggest that all the possible large applications have very probably not yet been conceived, and given time there seems to be almost no limit to the possibilities of expansion in the polythene film market.

(To be continued)

TWO HOLES A DAY

Forty-thousand feet of plastic pipe were laid underground recently in one-fifth of the time and with a 40% saving over conventional pipe, at the Pepper Pike Club golf course, Cleveland, Ohio. The pipe—Republic Steel's SRK—was installed at the record rate of two holes a day to provide the golf course with watered tees, fairways and greens, in addition to supplying irrigation to more than three acres of lawn surrounding the club.

Four- and six-inch SRK was installed for the mains, with one-inch diameter pipe extending to outlying greens and tees. In operation, the system handles 750 gallons of water per minute under a pressure of 120lb. per sq. in. Since the pipe is made of acrylonitrile-butadiene-styrene, there are none of the corrosion problems previously experienced, due to fertilizers and acidic soil.

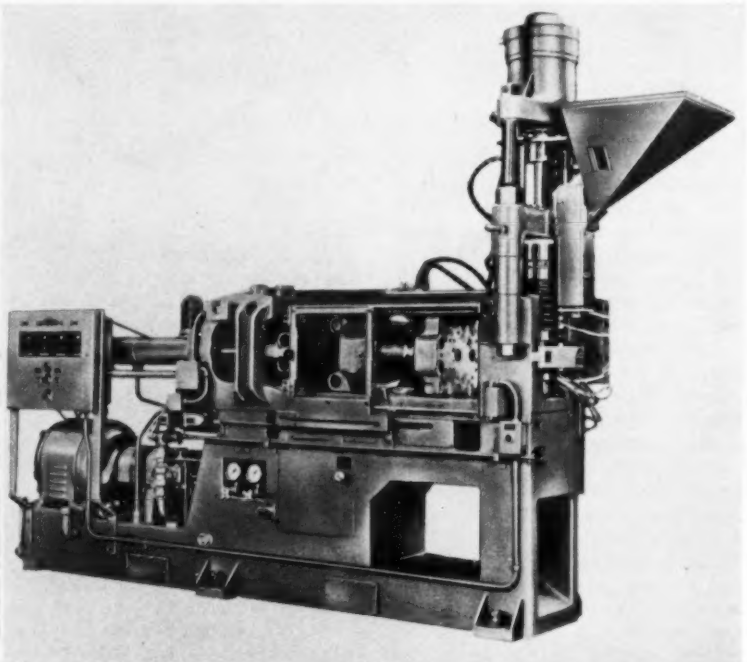
50,000 out of 672,000 pairs of boots and shoes in a Moscow shop were found to be defective, according to *Izvestia*.

Lester L150

NEW INJECTION MOULDING MACHINE

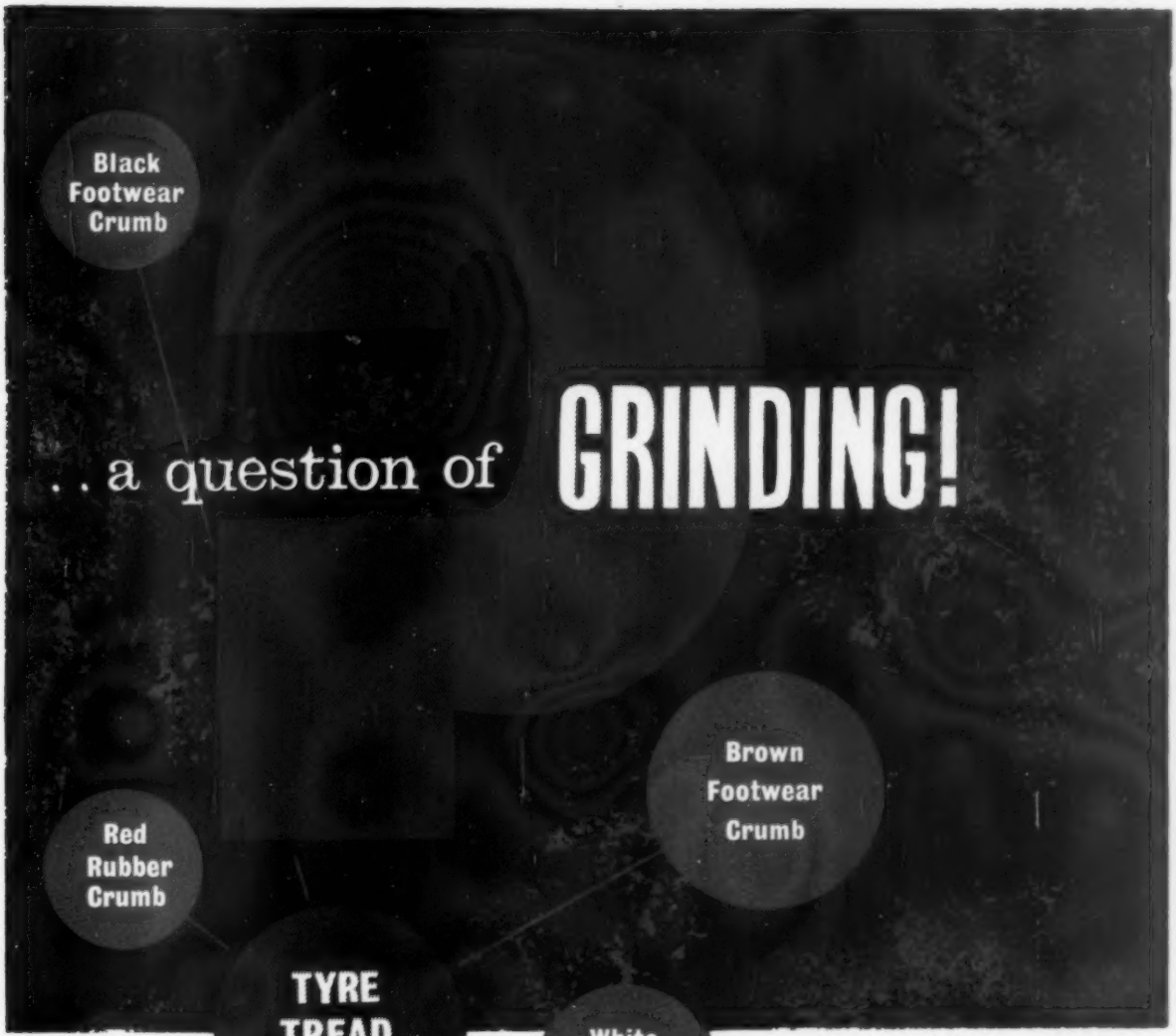
THE new Lester L150 injection moulding machine now being manufactured by the machine tool division of J. Brockhouse and Co. Ltd., Wolverhampton, is a high-speed fully automatic unit embodying as standard many features which, up till now, have been considered optional extras. An extra large pump driven by a 25 hp motor gives a dry cycle time of 4.7sec. For special purpose work on thin wall disposable packaging an auxiliary pump unit is available; this gives a dry cycle time of 3.5sec. The high pump capacity also ensures rapid injection speeds and is said to give mouldings of superior physical properties.

The vertical injection assembly can be easily retracted giving immediate access to the heating cylinder nozzle. The full injection load is taken to a thrust block on the machine base, thus eliminating damage to the nozzle and sprue bush of the mould. This injection unit incorporates, as standard, a cut-off attachment for low-viscosity materials, such as nylon. The injection cylinder itself utilizes a one-piece spreader unit which is internally heated and has accurate temperature control. One piece construction eliminates a majority of faults such as leaking, breakage, inaccessability, decomposition of materials, etc.



4·6 ounces can be moulded per slot, and other specifications given are: effective plunger displacement 14.5 cu. in.; recommended casting area at 20,000psi on the end of the plunger 50 sq. in. (this, like the lb. of material plasticized per hr. is dependent on the product and mould construction). The mould closing pressure is 150 tons; the capacity of the hopper 45 lb. and the total heating units 10 Kw.

Kulim Rubber announced that acceptances of its offer for the issued capital of Central Perak Rubber had exceeded 80% on February 23.



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THREE PAPERS AT SUCCESSFUL MEETING

IN the past, not least among the attractions of the annual meeting of the IRI London Section at the National College of Rubber Technology has been the excellent tea provided by the Domestic Science Department of the adjoining Northern Polytechnic. This alone ensures a good attendance, and chicken, sherry trifles and coffee were downed with gusto during the interval in the evening's programme.

An unusually eminent audience, even for a meeting of the London Section, included Sir John Dean, president of the IRI, Mr Herbert Rogers, a past president and chairman of the College Board of Governors, and Dr W. F. Watson, director of RABRM, who later described himself as 'an interloper from the Midland Section.'

The 5.30 lecture by W. E. Stafford and D. Sargent of the Rubber Regenerating Company Ltd., and entitled 'Present day manufacture and use of reclaimed rubber,' was read by Mr Stafford. After an outline of the history of reclaim and the principles of the reclaiming process, mention was made of five present-day processes: The digester process; the pan process; the thermal process; the thermodynamic or hot Banbury method, and the 'Reclaimator' or screw process.

The first was originally operated with sodium hydroxide as defibrizer but alkali reclaim is now virtually obsolete having been replaced by the products from a neutral process using zinc or calcium chlorides. The second uses steam at ca. 400°F., the absence of water leading to increased thermal degradation, the third process being an improved version of this employing superheated steam at 500°F. The fourth process runs likewise at high temperature but includes mechanical working which destroys fabrics and shortens the reclaiming period, the process being well adapted to dealing with scorched scrap. Unfortunately, these three processes, (2)-(4), are not very effective when dealing with SBR scrap which shows increased cross-linking rather than softening by reversion. The most important post-war development concerns the Reclaimator: the fabric is removed mechanically and the ground crumb is fed to the screw together with peptizers and softeners. Reclaiming takes from 3 to 5 minutes (*i.e.* one pass through the machine) as opposed to several hours in conventional processes.

Finishing operations include milling, straining, refining and winding up on special drums.

Mr Stafford compared formulations for reclaiming over four decades:

Date:	1919	1960	
NR tyre scrap, cracked ..	1000	—	
NR tyre scrap, fine cracked	—	1000	
Heavy mineral oil	10	—	softener
Heavy naphtha	—	80	swelling agent
Pine tar oil ..	—	35	tackifier
Reclaiming agents	—	2	peptiser
Sodium hydroxide	130	100	defibriser
Water	1600	1600	
Digestion time :	18 hours at 180°C		
	8 hours at 205°C		

Chief developments include the use of swelling agents (which are flashed off after the digestion stage and so do not appear in the product) and the use of chemical peptizers. It was curious, however, that in view of their earlier remarks about alkali-reclaim, the authors should choose to illustrate present-day practice by reference to this type of formulation.

Advantages of reclaim in compounding include:

(1) Lower power consumption and heat build up during mixing.
(2) Faster processing.
(3) Low thermoplasticity. (*Sic!*)
(4) Reduced swelling and shrinkage.
(5) Higher cure rate.
(6) Minimized reversion.
(7) Good ageing.
(8) Improved mould flow.
(9) Low price.

Disadvantages include:

(1) Inability to incorporate the materials into white or pastel shade formulations.
(2) Poor physical properties when measured at high rates of deformation (*e.g.* in abrasion and tearing).

The selection of a particular type of reclaim for a given application involves consideration of the following variables:

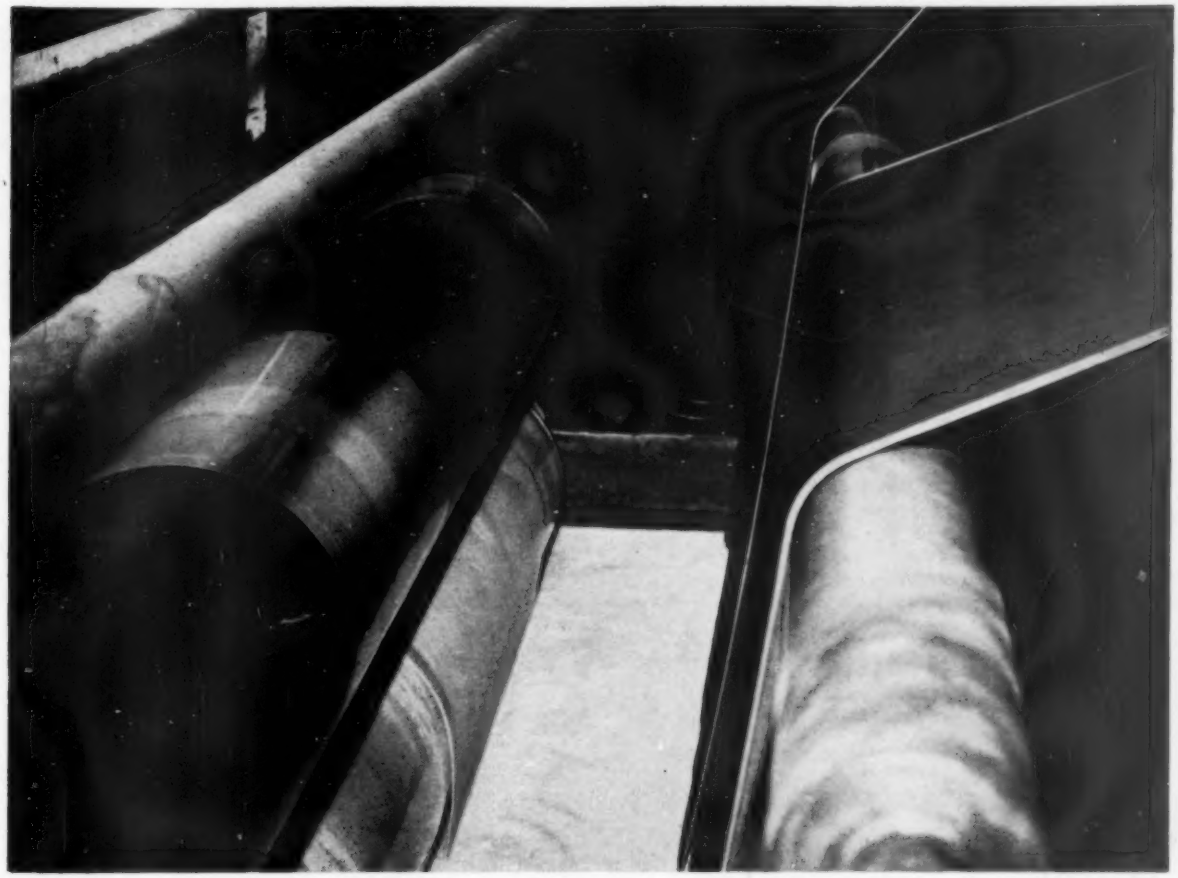
(1) Composition (*e.g.* RH content).
(2) Nature of reclaim manufacturing process.
(3) Smoothness.
(4) Processing behaviour in the compound.
(5) Possibility of discolouration and/or staining by migration.
(6) Effect of water.
(7) Characteristics influencing physical properties.

In applications, besides being used as extenders in mixes based on fresh rubber, reclaims have a number of special uses in friction tapes, in adhesives and sealants, and in carpet backings. Synthetic reclaims have not been fully exploited although butyl, in particular, may be reclaimed readily by simple thermal treatments. Good quality butyl reclaim vulcanizates possess tensile properties which are hardly inferior to those of the fresh compound and which show good tread wear and low permeability to air. Silicone reclaims can similarly replace fresh stock for many applications but the neoprene/acid anhydride reaction products are only suitable as hardening cheapeners.

Economic considerations suggest that, in the UK, we do not make the most of our scrap. Reclaim production remains at about 13-14% of NR turnover whereas in the USA the figure is up to 18% and in Germany 18-20%, the differences being due in part to the different compounding methods in various countries. Future prospects for reclaim suggest a slow increase in production over the next five years following the predicted increase in overall consumption of rubber. Should demand exceed supply of raw rubber, however, the reclaim industry has prepared for much more rapid development in order to fill the gap.

In the discussion, Mr Stafford stated that the use of NBR reclaims in mixes based on this polymer does not impair oil resistance; that more than 90% of UK reclaim production is of NR based materials (butyl, CR and NBR output being negligible); that no 'Reclaimator' is in operation in the UK at present; that the acid process for boot and shoe reclaims has largely disappeared; that recovery of the naphtha swelling agent after the digestion process is not usually practised; that mixtures of NR and SBR are not easy to handle in conventional processes but some success has been achieved to date. The effect of butyl reclaim on the cure rate of IIR compounds is linked with its method of preparation and need not be deleterious.

A vote of thanks was proposed by Mr S. P. Walker, a final year Associateship student of the College.



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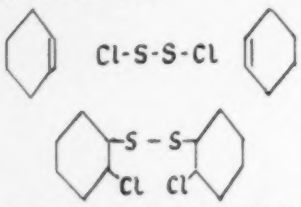
After tea, Mr G. N. Welding replaced Mr A. Fiber in the chair, and introduced the two speakers from the College, Dr J. Glazer and Mr D. J. Higgs.

Dr Glazier's paper summarized work he had done with Dr D. B. Vidwans on the 'Mechanism of the reaction between sulphur monochloride and cyclohexene.' In introducing the subject Dr Glazier referred to a previous study which he had carried out using rubber solutions when certain aspects of the mechanism of vulcanization had remained obscure. By using cyclohexene as a model molecule illustrating a *cis*-double bond, the present research had established a background mechanism which might prove useful in investigating the chemistry of the 'cold vulcanization' of rubbers and of unsaturated oils in the preparation of white factice.

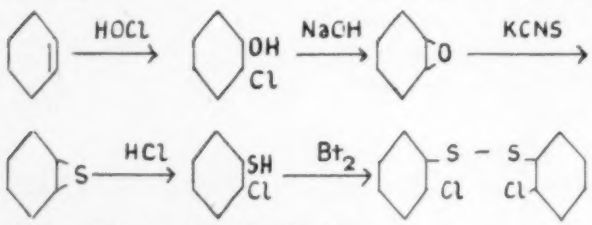
The stoichiometry of the reaction was shown to be:



di (2-chlorocyclohexyl) disulphide

Product analysis showed zero free sulphur, correct C, H, Cl and S analyses, a M.Wt. of 311 (*cf.* 299 theoretical); absence of unsaturation or of SH groups.

Further, an unambiguous alternative synthesis was achieved by the following route:



This product was indistinguishable from the reaction product obtained from cyclohexane and S_2Cl_2.

It was also shown that the same product was obtained whether an excess of olefin or of S_2Cl_2 was used.

The kinetics of the reaction were investigated by a dilatometric technique with temperature control to $\pm$ 5 x 10^{-4} °C. in the vicinity of the dilatometer bulb. The reaction was shown to be kinetically second order, being first order with respect to cyclohexene and first order with respect to S_2Cl_2. Further, the second order rate constant was substantially independent of dilution (in chloroform). As an independent check on the validity of the dilatometer method, the rate of disappearance of (yellow) sulphur monochloride was determined colorimetrically, extrapolation to zero time of reaction showing that none of the reagent was used up in a fast initial reaction stage. Good agreement was observed between rate constants obtained by the independent methods. The rate of disappearance of cyclohexene was explicitly measured by the disappearance of a characteristic C=C infra red absorption band in the course of the reaction. Again, satisfactory agreement was obtained between the rate constants.

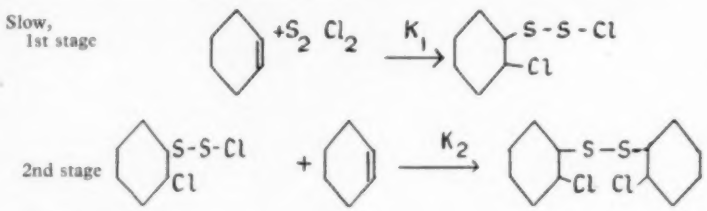
The effect of temperature on the rate constants was very small: ΔE (Arrhenius Activation Energy) values being as follows:

Solvent	*Condition*	ΔE(Kcals-mole^{-1})
$CH Cl_3$	Excess $S_2 Cl_2$	1.94
,,	Excess $C_6 H_{10}$	0.88
Benzene	,,	5.4

These values suggested that the rate-determining stage of the reaction was not a simple bimolecular one. Accordingly, tests were applied for radical or polar mechanisms, by carrying out the reaction in solvents and solvent mixtures of increasing polarity, the rate being shown to increase with increasing dielectric constant of the solvent. The effect of hydrochloric acid and ionized chlorides such as tetra-n-butyl ammonium chloride and cetyl pyridinum chloride was to increase the rate in ascending order of efficacy.

Possible Mechanisms

On the basis of this data, consideration was given to possible reaction mechanisms. A thermolecular reaction was rejected on kinetic grounds; also an ionic chain reaction involving a postulated $ClS_2\oplus$ entity and the possibility of the reaction product acting as initiator was investigated by adding extraneous product to the reaction mixture when no increase in rate was observed. Radical reactions were eliminated by kinetic analysis and by showing that there was no retardation of the reaction in the presence of benzoquinone. A two-stage mechanism:

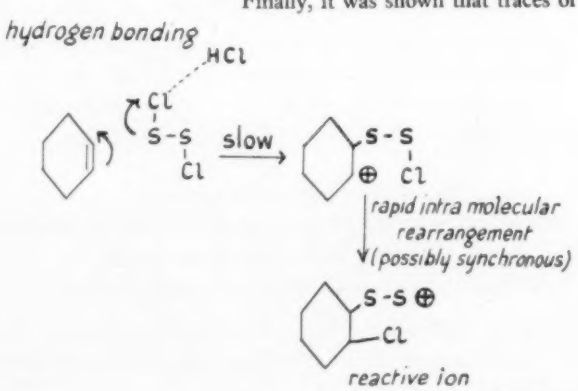


was almost permissible but it required that the intermediate product be very much more reactive than S_2Cl_2. This was so unlikely as to be unacceptable.

The kinetic studies suggested that the rate-demanding stage was polar rather than ionic and the observed catalysis by HCl is in accord with a mechanism of the following type. (See formula below.)

HCl facilitates heterolysis of the S–Cl bond by hydrogen bonding to the Cl. Quaternary salts do likewise more strongly by electrostatic interaction and steric arguments were advanced to explain the greater catalytic effect of cetyl pyridinium chloride over tetra-n-butyl ammonium chloride.

Finally, it was shown that traces of



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ROTUNDA

BPF Goes Gay

The British Plastics Federation held its annual dinner and dance on February 19 at Grosvenor House Hotel, London. The Federation chairman, Mr Norman Punfield, and Mrs Punfield, received more than 880 members and their guests.

In a brief speech of welcome after the dinner, Mr Punfield welcomed the Federation's guests and thanked members for their support. He said that such was the popularity of the occasion that, even with the remarkable numbers present, some applications for tickets had had to be refused. The chairman went on to say that they regretted very much the absence of their president, Mr Glassey, who was on the sick list. All would, however, be glad to know that he had that day come out of nursing home. He had sent them his wishes for a good evening.

This annual BPF occasion had established for itself a reputation for being a gay and outstandingly enjoyable evening. Last week's event topped, if possible, the success even of past occasions. The cabaret was excellent but the undoubted high-spot of the evening was the performance of 'The Temperance Seven,' a somewhat eccentrically composed orchestra which turned out to have nine members or, as the leader described it, one over the eight. This brilliant notion on the part of the organizers was greatly applauded and the band was forced to play for considerably more than its allotted time. The sight of heads of the plastics industry doing the Turkey Trot and other two-steps was worth going a long way to see. Altogether, the event was an unqualified success.

Lighter Resin

A polyester resin, Vibrin 158A, has been deveolped by the Naugatuck Chemical Division, United States Rubber Co. It is 10% lighter by volume than standard polyester resins now used in boat building. It is also specifically designed for application by the spray gun method.

Adrian C. Furse-Roberts has been appointed treasurer and secretary of Du Pont (UK) Ltd. as from March 1.

Among those at the British Plastics Federation Ball were (*facing page, left to right*)**: 1, Mr Stanley being received by the Chairman of the Federation, N. B. Punfield and Mrs Stanley with Mrs Punfield. 2, B. E. G. Harris (Bakelite), Mrs Harris, C. A. Rockhill (Bakelite) and Mrs Rockhill. 3, H. J. Howlett (Telegraph Construction Co.), Mrs Howlett, Mrs Kilbey, Mr Kilbey. 4, Mrs Wood, Mr Wood (David Bridge). 5, B. Royal (P. B. Cow), S. Hope (Commercial Plastics), Mrs Royal, Mrs Hope. 6, W. D. Davies (Streetly Manf.), L. G. Redding, J. A. Davis (Streetly Manf.). 7, Mrs S. Thompson (Punfield and Barston), F. A. Desmat, Mrs Desmat. 8, H. W. Graesser-Thomas, Mrs Graesser-Thomas, Mrs N. B. Punfield. 9, Mrs Lloyd, Dr Lloyd (BX Plastics). 10, Mr Potter (Bakelite), A. E. Skan (Tufnol). 11, Mr Anderson (Federation Treasurer), Mrs Anderson, R. T. Dobson, Mrs Dobson. 12, Mrs Johnson, E. Pace (Holoplast), Mr Johnson, Mrs Pace. 13, F. G. Cook, Mrs Cook, Mrs Rudd, C. T. Meredith, Mrs Meredith, P. G. Rudd (Ebenestos Industries). 14, Mr Wright (A. C. Delco), Mrs Wright, Mrs Hood, Mr Hood (Smith's of England).**

The international plastics exhibition at Helsinki from September 13 to 18 1960, will be, it is reported, associated with a congress at which the main topic will be the setting up of an international organization for the plastics industry.

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Design for Engineering

APPLICATIONS OF RUBBER AND PLASTICS

IT is always of interest to visit a new exhibition and to see the range of industrial activity covered. Today, with the development of so many new materials and equipment it is particularly appropriate that an exhibition like that of Engineering Materials and Design, which has just concluded, should take place. This essentially is a specialist show, and so any estimate of its importance should not be related to attendance figures.

Dominating the British Nylon Spinner's stand was a 100-ft.-long Dracone made of proofed nylon fabric. A new company has been formed to market these containers which have already been in use for transporting liquids over water. This picture of the Dracone, taken in Nigeria, shows how it can be wound for easy transportation after its contents have been discharged

As was to be expected, there was considerable emphasis on the newer materials, which meant that plastics were exhibited in various forms giving some idea of the variation of design that can be achieved by using different materials. There were examples of polyamides, thermoplastics and resin reinforced fibres in the form of products, and certainly the most eye catching was the Dracone, a 100ft. long collapsible cylinder used for the transportation of liquids over water.

This is made of neoprene-proofed nylon giving a tough yet flexible and virtually unbreakable container which has excellent chemical resistance. This flexibility can be seen from the picture showing the Dracone being collapsed through rollers after its cargo has been discharged. Also on the British Nylon Spinners' stand was a very useful example of the use of PVC/nylon laminate—an inflatable small shed or garage which is self-supporting without any interior struts. Demonstrating the strength of nylon was a cargo net made of slotted nylon. This net, although it only weighs 25lb., can lift 2 tons quite easily.

Thermoplastics of Dunstable showed a range of ducting and components made from epoxy and polyester resin bonded materials, but of particular interest was the inside cabinet of a refrigerator made from copolymer styrene, vacuum formed and drawn, of approximately 2ft. wide x 2ft. 6in. deep and 4ft. long. This demonstrates the accuracy to which vacuum forming can be employed on large dimension products.

Coating With Plastics

A number of resin bonded glass fibre tanks and also a rail container of 5 ton capacity (11ft. 9in. x 7ft. 4in. x 8ft.) were shown by United Coke and Chemicals Co. Ltd. This container is interesting because between the inner and outer polyester resin bonded glass fibre skins, layers of expanded polyurethane are incorporated. Also shown was a wash basin made of reinforced glass fibre *with terylene strands* incorporated in the glass strand for reinforcement purposes, from which it is claimed double the performance can be obtained—whatever this may mean.

Durable Plastics showed at this exhibition for the first time under their new name, Plastic Coatings Ltd., which becomes official on April 1 1960. Among the wide range of products which one expects to see from this company, it is difficult to pick out any one item for special mention, but the ability to coat large structures effectively is very well

Durable Plastics of Guildford showed numerous articles dipped or sprayed with pvc, ptfe or nylon. This is a steel ship's propeller dipped in pvc

THE TEAL

Small species of Duck. It is a native of Europe (including Britain) and Asia. It is a general bird of inland lakes and pools · though in winter large numbers may be seen at the mouth of rivers.

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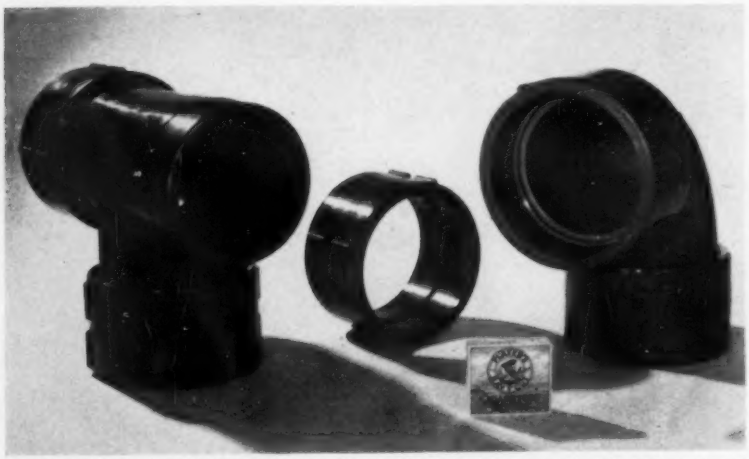
shown by the steel ship's propeller covered in PVC.

In the supply of plastics materials a useful range of nylon rod, tubes and mouldings was shown by Plastics Engineers Ltd. of Pontypridd, and there was also a useful little working model of a nylon pump, pipelines and gear system clearly indicating the range of activity to which nylon can be put. A wide range of plastic materials including nylon, polycarbonate, and polypropylene in the form of sheet, solid rod and tube was shown by Nylonic Engineering Co. Ltd. of Pinner, and this may well be an interesting source of material supply to plastics engineers.

Knitmesh Ltd. showed that practically anything can be knitted. There were examples of their work with both coarse and fine polythene mesh knitted tube. This may well have applications in filtration and fume scrubbing.



Specifically designed for the oil industry for handling crude oil, effluent and allied materials, these fittings (i.d. 6") are injection moulded in high-impact Geon PVC by Durapipe and Fittings Ltd.

Epoxy Resin Pattern

J. J. Harvey and Pressurecast Ltd. of Manchester had a wide range of products amongst which was an epoxy resin pattern which had been used for the production of 2,000 castings and certainly did not show any signs of wear. This point may certainly be of interest elsewhere, as epoxy resins may be a possible answer to the conveyance of abrasive liquors and mixes.

BRP had a very wide display of products and included a little model of a complete fume extraction system, showing what can be done in plant with PVC. A large tank 4ft. x 4ft. showed what can be done in HD polythene. There was also a suction strainer made in four moulded parts, entirely from rigid HD polythene; this gives some idea of the technical possibilities of this material. This principle could also be employed in the manufacture of a low-priced yet technically good range of both domestic and commercial fans.

The Nobel division of I.C.I. showed the use of silicone rubbers and resins in both mechanical and electrical contexts. One use illustrated was for the pressure roller of an extrusion coating plant; and a variety of cables were shown with silicone rubber insulation. One of the most ingenious exhibits on any stand, from a display point of view, illustrated an outstanding property of silicone rubber—its ability to operate over an extraordinary wide range of temperatures.

This model consisted of a length of silicone rubber which was continuously flexed while, at one end, it passed through an electric heater, and at the other, through a Drikold bath. The top temperature was 200°C. and the lower −70°C., but the rubber was quite unconcerned.

Ioco Ltd. displayed Ocoseal—natural and synthetic rubber bonded with reinforced plastics—mainly used for the sealing of electrical components. A number of synthetic rubber mouldings in a variety of designs were shown by Charles Weston of Salford.

5-gallon drum blow moulded in Rigidex high density polythene. Made by Polythene Drums Ltd., it weighs only 26 oz.

Midland Silicones had a comprehensive display of their silicone rubbers, which included applications of their cold-cure silastomer such as potting, encapsulating delicate components, making high- or low-temperature sealants, and preparing moulds and casts. The last application is already being experimented with by the police, as the silastomer is claimed to give accurate, quick casts of foot and tyre prints under difficult conditions.

It was not easy to determine the purpose and emphasis of this exhibition or to be always aware of where design and materials were really being stressed at individual stands. It may be that, as this is the first exhibition of its kind, teething problems have arisen which cannot always be anticipated. One cannot help asking, nevertheless, what difference there is between this and the ordinary Engineering or Chemical Plant Exhibition.

New Singapore Brokers

A new rubber broking company is being planned by ten leading Singapore rubber dealers, according to a circular from them sent to all members of the trade in Singapore and Malaya.

The companies are Anglo-American Corporation, Boustead and Company, Harrisons and Crosfield, Paterson Simons and Company, Hooglandt and Company, Maclaine Watson and Company, Sandilands Buttery and Company, the Rotterdam Trading Company, the East Asiatic Company, and Harper Gilfillan and Company.

The dealers said they believed the rubber market would be stabilized by the setting up of the company and that business would be expanded for the benefit of Malaya. They emphasized that the dealers did not wish to eliminate any strong and worthwhile competition and that they 'regret that existing broking firms are strongly opposed to the formation of the new company.'

The company would be owned by the principal dealers, both European and Chinese. It was estimated that its capital would be about two million Malayan dollars. Shares would be owned by each participating company.

Dr Charles F. Eckert has been appointed manager of elastomer research at the Research Centre of United States Rubber Co.

VIEWS *and* REVIEWS

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **Dr Schidrowitz**

Black Masterbatches

THE Summer 1959 meeting of the *Southern Rubber Group* (USA) devoted a special session to a discussion of 'Recent Developments in Black Masterbatch,' and the January 1960 issue of *Rubber Age* has, in view of the processing advantages offered by this process, published the complete text of the three papers presented.

The session was divided into three parts: 1. *Dispersant Types*, by R. A. Forrester (United Rubber and Chemical Co. Baytown, Texas); 2. *Non-Dispersant Types*, by M. E. Samuels (Manager, Development Dept., Copolymer Rubber and Chemical Corp., Baton Rouge, Louisiana); and 3. *Compounding*, by R. T. Laporte (Seiberling Rubber Co., Akron, Ohio).

I feel that, as I cannot give an account of all three papers, the following from No. 3* may be welcome, as expressing views that will approach an expression of opinion, to most of which there will be agreement. It is from No. 3, and expresses:

Outlook for Higher Performance

'Everyone is familiar with the progress that has been made in the last few years in the manufacture of improved quality masterbatches. Although our interest prior to these latest developments was limited due to our feeling that the quality level was not quite up to that of a good dry mix, we can definitely say this situation no longer exists. There are black masterbatches available today that will give road performance superior to any comparable formulation prepared by the dry mix method.

'We have run test after test on private test fleets, commercial test fleets and mileage accounts, from which we derived the following statement: "Tread stocks made from commercially available black masterbatches, and compared directly with a like formulation by the conventional dry mix method . . . consistently show improved resistance to fatigue cracking and show equal or better tread wear." I was purposely conservative in my statement as to the wear or abrasion properties of masterbatch type treads. Wear reports one hears about, such a development as we are discussing, range from no improvement, or actually 5 to 10% poorer, to as much as 30% improvement or more. Anyone who has been closely connected with tyre testing can recall similar results in that field.

'We have had some road test results that were equal and some that were in the 10 to 15% improvement range. We have seen enough tests, however, to say definitely that "average wear resistance is in the neighbourhood of 5 to 7% better than a comparable formula dry mixed." This, we feel, is a substantial improvement over the earlier black masterbatches and, coupled with consistently better flex fatigue, make the black masterbatch process something which cannot easily be ignored.

'One of the questions which often comes up in a discussion of black masterbatch is: "What effect does black masterbatch have on power consumption and what is its power peak compared with that of a conventional dry mix procedure?" We have made a study of these factors, using both single and double stage mixing with the results shown on the accompanying table.

COMPARISON OF BLACK MASTERBATCH AND DRY MIX STOCKS

Type of Mix	Black Master	Black Master	Black Dry	Black Master	Black Dry
First stage (rpm) ..	20	20	20	40	40
Second stage (rpm) ..	—	20	20	20	20
Total Banbury time ..	6½ min.	7½ min.	10½ min.	5 min.	6½ min.
Power peak, first stage (kva)	224	208	256	448	528
Power peak, second stage (kva)	—	280	272	264	264
Total power/1,000 lb. (kwh)	31.26	44.87	44.89	45.19	66.53
Williams plasticity ..	3.56	3.35	3.46	3.40	3.52
Williams recovery ..	.33	.29	.23	.30	.25
Visual dispersion ..	Good	Good	Good	Good	Good

'It is interesting to note that there is no "shock" problem in the process of adding black masterbatch bales in a Banbury. Actually there is a greater power demand when slab stock is added, probably because of the easier and faster loading of slabs.

'In conclusion, black masterbatches, as they can be currently manufactured, offer these advantages in varying degree.' (*Eight advantages:* Cleaner; improved processing; reduced mixing time; reduced power cost; lower peak power; more uniform quality; enhanced physicals; better average performance in treads, claimed.)

*With acknowledgements to the Author, and the Editor of *Rubber Age*.

Notes

The Plastics Division of I.C.I. have sent me Technical Note No. IS689, which describes the compounding, processing techniques and properties of several types of cable-sheathing compounds which are based on 'Butakon' AC5502.

'Butakon' butadiene copolymer AC5502, a blend of a 'Butakon' A nitrile rubber and a fully-gelled 'Corvic' polyvinyl chloride can be widely used as the basic component of economical black and coloured cable-sheathing compounds.

'Butakon' AC5502 combines the properties of nitrile rubber and PVC; vulcanized 'Butakon' A nitrile rubbers are characterized by excellent resistance to oils and fuels and by a lack of a set under load at temperatures of 80°C. and above.

PHILIP SCHIDROWITZ

Malayan Tyre Plant

The Dunlop Rubber Co. is to establish a $25m. (Malayan) rubber tyre plant in Kuala Lumpur, according to a Government statement made last week.

The plant is expected to produce about 400,000 tyres a year from about 2,000 tons of Malayan rubber during the initial stages. This will be sufficient for the whole of Malayan demand and export. The company has bought forty acres of land for the plant, the construction of which will commence in the middle of this year.

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MEN *and* MATTERS

A Review of People and Events

by George A. Greenwood

A WEEK or two ago the rubber industry lost, from active service at any rate, another of its old stalwarts. This is Mr Wilfred Bowden, F.I.R.I., the BTR Industries Ltd. Group chemist, and as one would expect, his retirement evoked a response from his many old friends and colleagues. They arranged a dinner in the board room of the new factory at Farrington (Lancs.), over which BTR director Mr S. G. Deaves presided and, in the course of the evening, presented Mr Bowden with a set of golf clubs. In doing so he paid tribute to their guest's many years of loyal service to the company, and goodwill messages were received from Mr P. W. Howard, a deputy chairman, the managing director, Dr W. D. Scott, and from several old friends who were unable to be present for health or other reasons.

They tell me that it really was an occasion. Many events during the company's early days were recalled, and other speakers supported Mr Deaves in his tributes.

Originally associated with the textile industry, Mr Bowden first transferred to rubber after service in World War I, when he joined the Wood Milne Company at Leyland (Lancs.). There he came under the influence of Dr Pickles, and after several years at Bradford-upon-Avon he returned to Leyland in the mid-1920s to become chief chemist at what was then the British Goodrich Rubber Company. In due course he became group chemist for BTR Industries Ltd. and Silvertown Rubber Co. Ltd.

For many years he has been a member of FBRAM Technical Committee, and during World War II he was very closely associated with Mr S. A. Brazier in the important standardization work that had to be undertaken on an emergency basis as a result of events in the Far East.

In his younger days, I am reminded, Mr Bowden was an amateur soccer player of no mean ability. Also for many years he captained the BTR cricket team—he was a very fine performer both with ball and bat. Now he is a keen golfer, and has a number of achievements to his credit.

Colleagues throughout the industry will join in wishing Mr and Mrs Bowden a long and happy retirement at their home in Blackpool.

The Literature of Trade

The Universal Asbestos Manufacturing Co. Ltd. has been awarded a certificate of merit for its entry in Class 1 (manufacturers' own literature) in the 1959 Trade and Technical Literature competition organized jointly by the Royal Institute of British Architects and the Building Centre.

The UAM entry was a composite affair, and it won the certificate on this account, all the publications being judged to fulfil requirements for such things as standard sizes, inclusion of essential information, general layout and presentation, and so on.

The award is an acknowledgment of the UAM Group's enterprise in seeking a solution to one of the most urgent problems now facing the building industry—that of presenting technical information in a convenient and efficient manner. The prize-winning catalogues are the first of more than 50 to be revised by the Group to cover all its products.

The competition was part of a general campaign to improve the standard of manufacturers' trade and technical literature, and the assessors strongly recommended that it should be continued. A point of interest is that all the entries are being exhibited at the Building Centre in Store Street, W.C.1, at a show which opened last week and continues until next weekend (Saturday).

Honouring Harry Willshaw

There is to be, at the Savoy Hotel, on Wednesday evening March 16, a dinner which in some respects, indeed if not all, will be of real significance in the rubber industry. Mr H. Willshaw will be the guest, and this function will mark his retirement from the Dunlop Rubber Company after an association with it which began so long ago as 1913. I cannot think of anybody better known to those who use rubber, or certainly of one who is more likeable and popular. For years now he has been chief consulting engineer to the company and only a little while ago he was over in the United States paying a visit to the Dunlop Tire and Rubber Corporation at Buffalo, when old and new executives of the factory had a pleasant reunion meeting at dinner.

Three of those present—Mr Willshaw himself, Mr Van Valkenburgh and Mr Howard Elden who were at the Buffalo dinner, between them combined 110 years of service to Dunlop, Buffalo, where Mr Willshaw saw the start of the first major building operation. He was there from 1919 to 1925 as assistant factory manager.

Born in 1892 in Birmingham, and educated at Saltley College and Birmingham Technical College, Mr Willshaw went through his early engineering training with the Lanchester Motor Company under Mr George Lanchester himself.

NR Technical Service

Ralph F. Wolf, formerly manager of Compounding Research Columbia-Southern Chemical Corporation, Barberton, Ohio, has joined the Natural Rubber Bureau, USA office of the Natural Rubber Development Board, as Director of Technical Service. He is at present in the UK and his itinerary includes visits to the Natural Rubber Development Board and the British Rubber Producers' Research Association. For some time, Mr Wolf wrote for *RJIP* an amusing and informative 'American Letter.'

H. C. Bugbee, President of the Natural Rubber Bureau, commented that the appointment 'reflected the broad expansion in research now being effected by the Natural Rubber Industry.' He added 'We have been doing excellent work at our laboratories abroad and have long needed someone here who could pass on to the American manufacturing industry knowledge of what we are accom-

plishing. Superior Processing rubber is a good example. This has had some recognition and use in the USA, but not near that deserved by the efficiency it adds to extruding and calendering operations.'

Polymer Addition

Polymer Corporation Ltd. has formed a new staff group within the marketing division of the company. It will be under the direction of E. E. Gale, who will be responsible to R. E. Hatch, Vice-President (Marketing). H. A. Pfisterer, previously supervisor of the rubber technical service laboratory, will transfer to the new group and will be responsible to Mr Gale for specific technical aspects of product development and evaluation.

E. E. GALE

The new organization will be responsible for all marketing aspects of new product planning and development and the maintenance of a continuing liaison between the Marketing and Research and Development Divisions.

Mr Gale is a graduate of McMaster University (M.Sc. in Physics), and he joined Polymer in 1949, transferring to the Marketing Division in 1953. He

DR LUMB

H. PFISTERER

was appointed Supervisor of Technical Services in 1958.

Dr P. B. Lumb, formerly of the Company's Research Division, replaces Mr Gale as Supervisor of Technical Services. A graduate of Oxford University, Dr Lumb joined Polymer Corporation in 1953 as a senior research chemist in the Research and Development Division where he was engaged in the basic studies of the polymerization of butyl rubber.

Mr Pfisterer, following graduation from Queens University in 1946, came to Polymer Corporation as a chemist in No. 1 Pilot Plant. He became supervisor of the Rubber technical Service Laboratory in 1953.

£60,000 Stake

Sir Alexander Fleck, who as you know retires as chief of I.C.I. at the end of next month, and is to continue devoting the stimulation of interest in and the raising of money for the projected technical staff college, is already a happy man. To date, 30 firms have, under his inspiration, promised to provide £60,000 of the £100,000 required to give industry an equal stake in the new venture with local authorities and the Ministry of Education.

Macrocandies in Moscow

I notice from the programme of the Moscow Symposium on Macromolecular Chemistry (June 14-18), that while the men are talking macromolecules, the ladies haven't been forgotten. They have their own programme made out for them by the women's committee of the symposium. It includes trips to the Kremlin, the Tolstoy Museum, the House of Fashions, an art gallery, the Lomonosov State University, the Novo-Devichyi Convent, the environs of Moscow, the Moscow-Volga canal, nurseries, hospitals, and a candy factory.

Why, I wonder, a candy factory? A pause for refreshments? Knowing my limited staying power on such tours, nothing less than a bag of macrocandies would satisfy me after that list.

Question Corner—106

(Second Series)

431. What is the process known as slush moulding?

(Answer next week)

Answer to Question Corner—105

430. Zein is a by-product of corn and is concentrated in the gluten fraction during the preparation of cornstarch. It may be extracted from the gluten meal using 85% isopropyl alcohol at about 60°C. The extract is cooled and filtered to remove any undissolved particles and the clear extract mixed with an equal volume of hexane. The mixture separates into two layers, the upper one consisting of most of the hexane, a large part of the isopropyl alcohol and practically all the undesirable impurities. This layer is separated by centrifuging, leaving a 15-20% solution of zein in alcohol. The small percentage of hexane remaining can be removed by vacuum distillation.

The zein is then precipitated by spraying the solution into very cold water, where it rises to the top in a fibrous form. This is collected, pressed into cakes, ground and dried in a stream of hot air.

Zein coated paper is grease and oil resistant and may be used for food packaging. It reacts with formaldehyde, though slowly. It can be made into plastics in a similar way to casein and cured by immersion in a formaldehyde solution.

Like other protein plastics, zein depends on water as a plasticizer to improve its flow properties, although less is required than in the case of, for example, casein. The moisture resistance is somewhat better than casein.

(Another question next week)

Coastal Exposure

The uses of Polimul emulsions in the paint, adhesive, leather and textile industries will be the main feature of the Dunlop stand at the Oil and Colour Chemists' Association Exhibition which opens in London on March 15. Cement-asbestos panels which have been coated with Polimul-based paints will be shown after six years' exposure near the coast.

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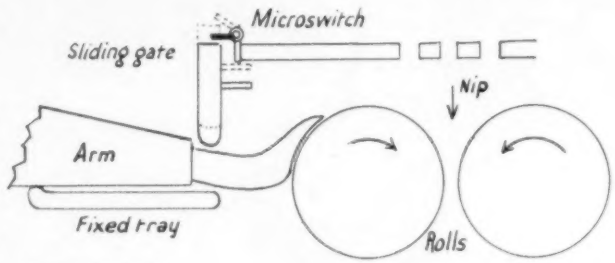
IRI AT NCRT Continued from page 312

ferric chloride increase the reaction rate of 30 or 40-fold and this may suggest the possibility of an ionic rate-determining stage in the presence of this material.

The final paper by Mr D. J. Higgs described a 'New Guard for the 12in. laboratory mill combining maximum safety and minimum handicap.' Mr Higgs summarized early work and paid tribute to the work of Lunn in analysing the problems of guarding. He showed by means of slides and film that the type of guard fitted by a leading manufacturer at the present time was so restrictive to the correct use of the mill that accidents might be caused merely in making attempts to use the machine for its proper purpose. Cross-cutting and rolling is not possible since there is only a 1in. gap between the surface of the roll and the safety 'trip' bar. The feed hopper is a potential danger due to 'jammed' rubber in the neck, it permits the hand to go through (and even into the nip) and it allows powders to be scattered far and wide during mixing. Existing scraper devices are inefficient and their guards do not prevent trapping of the hand against the exposed knife edge. The example shown in the film demonstrated four or five additional hazards introduced by the designer of the guard who had obviously given little thought to its function.

The new guard designed by Mr Higgs overcomes these problems most satisfactorily by use of a ''Judo' principal illustrated below:



(Patent pending)

Even were the microswitch on the gate to fail, the hand could not approach the danger area. (This is not true of the majority of existing guards.) The design is elegant and nip visibility is good; also, the guard is readily removable for cleaning purposes and does not restrict any normal rubber mastication or mixing operations for batches of up to over 1,000g. in weight.

Finally, the new guard was demonstrated by a film and by closed circuit television relayed from the College mill room.

Dr Watson proposed a vote of thanks to Dr Cotton and the College authorities for the facilities they had provided and paid tribute to the well-contrasted original contributions which were each outstanding in their respective fields, and he recalled the 'bad old days' of the rubber industry when rule of thumb methods and unsafe working conditions were the order of the day. There can have been few members present who regretted their passing.—D. A. S.

New Synthetic from CWH

POLYBUTADIENE FOR TYRES

CHEMISCHE Werke Hüls AG has obtained a licence from Studiengesellschaft für Kohle mbH, Mühlheim, to produce polydiolefins. The first product to be commercially manufactured by Chemische Werke Hüls AG on this process is polybutadiene, a new type of synthetic rubber which will lend itself particularly well to the manufacture of truck and other giant tyres.

Technical rubber tests have shown that by admixtures of polybutadiene rubber to natural rubber virtually a natural rubber will be obtained offering improved abrasion resistance. Moreover, such mixtures are outstanding for their excellent hysteresis properties. Further tests have shown that compounds containing oil and carbon black are likewise interesting as base materials. Owing to these properties the new synthetic rubber is expected to hold out good market prospects. The product will not compete with the cold rubber types offered by Bunawerke Hüls but will supplement this product line and/or substitute part of the natural rubber to be imported.

For the manufacture of polybutadiene rubber, Hüls has developed two processes of its own, utilizing catalysts which have been found by Professor K. Ziegler.

The new polybutadiene rubber of Chemische Werke Hüls, the first specimens of which are expected to enter the market this spring, will supply the rubber industry with another interesting raw material.

(Polybutadiene received attention in the very early days of synthetic rubber. In 1910, for instance, Lebedev reported that it yielded a rubber-like substance on heating. In 1956, Phillips Petroleum announced that they had succeeded in preparing 1-4 polybutadiene in both *cis* and *trans* varieties. The CWH announcement takes things a stage further.)

London Rubber Company made no comment on a rumour that they had bought an elastic stocking concern for £500,000.

CORRESPONDENCE

Heat Treatment of Butyl

To the Editor.

Sir,—I have read the interesting paper which you published in the December 5 issue of RUBBER JOURNAL AND INTERNATIONAL PLASTICS. It is evident from the discussion and recommendations in the paper that Mr Penn has taken the time to completely study and understand the published work which was done in these laboratories on the heat treatment of butyl rubber. I am writing, therefore, to express my appreciation for his interest in our work, and for his attention to the technical details underlying its application to commercial practice. He has, I believe, made an important contribution to the knowledge of the subject, especially in relating the onset of undesirable polymer - polymer interaction to Mooney scorch.

Very truly yours,

A. M. GESSLER.

Esso Research and Engineering Co.,
Chemicals Research Division,
Linden, N.J., USA.

Plantation Commentary

MALAYA LARGEST PRODUCER FOR YEARS TO COME

by our Malayan Correspondent

ALTHOUGH there was a slight drop in overall shipments in the last quarter, superior processing rubbers from Malaya again had an excellent year during 1959 with a sales graph that would give pleasure to any organization.

A comparatively new development, SP rubber provides qualities not found in normal rubber and is particularly suitable for extrusion. As late as 1956 Malaya was shipping only trifling quantities but last year shipments rose from a little over 400 tons in the first quarter to 659 tons in the last quarter. The Rubber Research Institute, which was responsible for the development of SP rubber, reports that there was a steady increase in the demand for superior processing RSS rubber towards the end of the year which was just matched by production.

Superior processing rubbers are now being made by four companies in Malaya in addition to the Rubber Research Institute's Experimental Station. They are Harrisons and Crosfield (Malaya) Ltd. (RSS, crepe and air-dried sheet), Plantation Agencies Ltd. (RSS, crepe, brown crepe—the firm will make ADS), Socfin Co. Ltd. (brown crepe and ADS), Ban Hin Estate (crepe and RSS) and the Rubber Research Institute Experimental Station (RSS, brown crepe and PA-80).

Some of the more optimistic forecasts have been that Malaya will eventually be shipping about 30,000 tons of SP rubber a year. It has certainly recorded outstanding growth in the last three years.

Replanting Plans

The new Minister of Commerce and Industry, Inche Mohd. Khir Johari, was by no means so definite about the possibility of opening up large areas of new land for rubber as the Ministry has been in the past. Inche Mohd. Khir who moved into Commerce and Industry from Education, said that he might advocate a programme of a million new acres of high-yielding rubber in 10 years. This was the programme put forward by the former Minister of Commerce, Mr Tan Siew Sin, who before he became a Cabinet Minister was a rubber planter.

There is no doubt that the major difficulty with implementing such a programme is land which under Malaya's constitutional system is vested in the 11 States. They have the right to refuse or grant land applications in most cases and Inche Mohd. Khir emphasized that he planned to stress urgently in the National Land Council the need for more rubber land. Since the recent series of elections which produced elected State Governments there had, however, been a 'marked improvement' in the attitude of the States.

Many estates here can testify to the reluctance of some States to grant new land for rubber while the tin industry has been in an even worse position.

One of the major aims of the Minister will be to get the very smallest smallholder onto the replanting bandwaggon. For several years there has been in existence a scheme for financially helping the small man with less than five acres of rubber to get new land and plant this with high-yielding rubber while still retaining the income from his old crop. This is designed to help the tiny capitalist with one, two or three acres of rubber who cannot face the prospect of destroying his old rubber and losing the income from it.

Meanwhile, a preliminary report of the smallholding replanting programme for last year shows a marked improvement. By the end of the year, there had been 34,811 applications from smallholders for replanting aid, covering a total of 159,820 acres, the best year yet for replanting with smallholders. Of interest is the fact that the largest number of applications came from South Johore, one of the worst areas during the Communist war but now completely cleared of terrorists. The fact that villagers are now thinking ahead to a long-term future during which they will have an opportunity to see their rubber grow to maturity, is of more than rubber industry interest.

Malayan rubber leaders are fairly certain that Malaya is going to be the largest producer of natural rubber for many years to come despite reports that Indonesia is now considering a smallholders' replanting scheme of her own. The Malayan view is that Indonesia has now lost the initiative and that even the most strenuous efforts will not regain it.

The Chief Replanting Officer of the smallholders' scheme in Malaya, Mr Tang Teng Poey, said: 'It will take Indonesia many years to catch up with the progress we have made in Malaya. We have gained an initiative we may never lose.'

British Official Retires

The Economic Adviser to the Malayan Government, Mr O. A. Spencer, one of the last senior British officials left, is to retire shortly under the Malayanization programme which provides for Malayan officers to replace British officials. He was the last British officer to serve in the former Federal Legislative Council which came to an end in August last year with the general elections.

A graduate of the London School of Economics, 47-year-old Mr Spencer may take up a senior appointment with the United Nations. Throughout his Malayan career he has been closely concerned with the rubber industry and piloted through the Legislative Council the measures which provided large-scale assistance for estates and smallholdings in replanting old rubber.

Rubber Market in Malaya

A rubber market and a stock exchange in Malaya, strongly favoured by the Minister of Finance, Mr Tan Siew Sin, will not come until there is a move in commercial circles to set them up. This has been made clear by Government spokesmen and may well spell the end of both schemes as much of the comment by dealers and brokers has been unfavourable.

Many brokers consider that Malaya is adequately served by the facilities available in Singapore and by brokers in Malaya who are in touch with the Singapore share market. With regard to the rubber market, dealers' views are not so clearly defined. But there has not been any move to take the initiative.

Secretariat Building

A search is now being made for a site for a rubber secretariat building in Kuala Lumpur which will accommodate the offices of the Rubber Producers' Council, the United Planting Association of Malaya, the Replanting Boards, the Natural Rubber Development Board, the Malayan Rubber Fund Board and several rubber associations. They are at present in separate offices and the scheme for a secretariat was first proposed by the Rubber Producers' Council and strongly supported by the Controller of Research, Sir Geoffrey Clay.

Estate Advisory Service

The Rubber Research Institute has now set up a special estate advisory service headed by Mr L. H. Davidson. It will help estates handle any problems which occur from time to time and will have facilities to follow-up advice. In the past these inquires have been handled by different divisions in the institute. The new service will pay particular attention to the smaller estates, which have never come into contact with the institute, through field visits and other means.

Currency Decision

Malaya, Singapore, Brunei, Sarawak and British North Borneo will continue to use a common currency. An official statement released at the end of a conference between representatives of these territories said that complete agreement had been reached on this.

Rubber Statistics

JAPAN — WESTERN GERMANY — CANADA

ACCORDING to information released by the Japanese Rubber Importers' Association, Japan imported 14,932 tons of crude rubber during December, some 4,600 tons more than during the preceding month. This total included 10,462 tons from Malaya, 2,236 tons from Thailand, 821 tons from Sarawak, 597 tons from British North Borneo and 509 tons from Ceylon. Imports of natural latex totalled 2,246 tons during December, of which Malaya supplied 1,932 tons and Indonesia 314 tons; this represented an increase of nearly 500 tons over the previous month's imports. In addition, there were gutta-percha imports, all from Malaya, of 1,016 tons in December, compared with November imports of 2,251 tons.

Imports of styrene butadiene during December fell to 1,899 tons, having amounted to 3,031 tons in the previous month. Of this amount, 1,300 tons came from the USA, 587 tons from Canada and 12 tons from Western Germany. December imports of synthetic latex increased from the November total of 247 tons to 767 tons. Of this total, the USA provided 732 tons, Canada 13 tons and the UK 21 tons. Other synthetic rubber imports rose sharply in December to 1,272 tons, having amounted to only 480 tons in the previous month. This total included 1,076 tons from the USA, 188 tons from Canada, 1,016 tons from the UK, 1,256 tons from France and 5,455 tons from Western Germany.

Scrap rubber imports in December amounted to 479 tons, only some 20 tons less than in November, and of this amount, 191 tons came from the USA, 235 tons from the UK and 33 tons from Australia.

Western Germany

The Secretariat of the International Rubber Study Group has now issued details of the overall German rubber position for the period ending October 31 last.

During the first ten months of the year, Western Germany's natural rubber imports totalled 117,319 tons, of which 11,279 tons consisted of latex. This represented an increase of almost 10,000 tons compared with the previous year. Malaya supplied the bulk of these imports, with 58,475 tons, while Indonesia supplied 16,092 tons; this represents an increase for Malaya of some 5,000 tons, but a decrease for Indonesia of rather more than 10,000 tons. Other countries providing this rubber included Ceylon (9,697 tons), Nigeria (10,553 tons), Vietnam (11,294 tons), Thailand (3,486 tons), Burma (3,083 tons), and the Belgian Congo (2,207 tons). At the same time, 763 tons of natural rubber were exported, leaving a new supply of 116,556 tons.

Consumption of natural rubber during this period amounted to 118,239 tons, of which latex accounted for 10,658 tons, an increase of between 5,000 and 6,000 tons compared with the corresponding period of 1958. Stocks at the end of October stood at 9,110 tons of crude natural and 917 tons of natural latex, having fallen by some 4,500 tons during the course of the year.

Synthetic rubber production in Western Germany during these months rose to 36,785 tons, well over double the previous year's total for this period. In addition, there were imports of 29,268 tons as against 32,857 tons, the USA supplying 21,191 tons, Canada 3,905 tons and Italy 2,928 tons. Exports of synthetic rose from 3,799 tons to 9,293 tons, to leave a new supply of 56,760 tons as against 45,912 tons. Consumption of synthetic rubber totalled 55,706 tons, an increase of 13,000 tons, and stocks by the end of October had fallen somewhat, standing at 6,581 tons compared with the year-end figure of 7,224 tons.

Production of reclaim rubber in Western Germany during the first ten months of the year totalled 34,807 tons, an increase of some 3,000 tons compared with the previous year, and after allowing for exports of 29 tons and imports of 1,649 tons, there remained a new supply of 33,187 tons. Consumption of reclaim totalled 34,379 tons, an increase of 3,500 tons, and stocks at the end of October stood at 3,705 tons, having fallen by rather more than 1,000 tons during the course of the year.

Canada

In order to meet higher demand for all lines of rubber products, the consumption of all rubber (natural, synthetic and reclaim) in Canada in 1959 recorded a sharp increase over the year earlier.

According to the Dominion Bureau of Statistics' monthly report on consumption production and inventories of rubber in 1959 increased 19.8% to 265,572,000lb. from 221,600,000 in 1958.

The year's consumption of natural rubber advanced 19.4% to 99,168,000lb. (83,072,000); synthetic 22.5% to a record 128,153,000lb. (104,654,000) and reclaim 12.9% to a peak of 38,251,000lb. from 33,874,000.

December rubber consumption declined 3% to 20,625,000lb. from 21,267,000 in same month of 1958. The month's consumption of natural rubber fell to 7,151,000lb. (8,415,000) and reclaim to 2,961,000lb. (3,203,000), while synthetic rose to 10,513,000lb. (9,649,000).

Considering the situation in terms of end products use, consumption of all rubber in the production of tyres and tubes, including tyre repair materials, decreased by 2,675,000lb.

Domestic production of synthetic rubber showed a good rise in December at 12,963 long tons, compared to 11,853 month before and of reclaimed 549 tons against 561.

The report indicates that consumption of natural rubber in 1959 at 99,168,000lb. accounted for 37.4% of all rubber consumed; synthetic accounted for 48.2% at 128,153,000lb. and reclaimed 14.4% at 38,251,000lb.

Nigerian Rubber Exports

Rubber exports for the month of October 1959 totalled 2,778 tons, including 1,266 tons to the United Kingdom, 710 tons to Western Germany, 305 tons to Czechoslovakia, 85 tons to US and five tons to the Netherlands. Crepe exports amounted to 1,813 tons. The US took 800 tons and the United Kingdom 618.

BOOK REVIEW

FBI REGISTER OF BRITISH MANUFACTURERS—1960. (32nd Edition. Published for the Federation of British Industries by Kelly's Directories Ltd. and Iliffe and Sons Ltd. 1,164 pages. 42s.)

This comprehensive guide to a substantial cross section of British industry contains lists of the products and services of over 7,500 member firms under more than 5,400 alphabetical headings.

In addition to the classified buyers' guide there are seven other sections giving addresses of companies and valuable information about trade associations, proprietary names, trade marks, etc. The French, German and Spanish glossaries give translations of every product term used in the main buyers' guide, each being numbered for easy reference between the English headings and their translations.

The President of the FBI, Mr W. H. McFadzean, introducing the 1960 edition of the FBI Register, says in an introduction: 'British firms manufacture practically every type of product for which there is a market, and it is to help the prospective buyer that this annual publication is primarily intended.'

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

ABRAC Appointment

Mr R. G. Mason, B.Sc., A.R.I.C., has been appointed a director of A. Boake, Roberts and Co. Ltd. He was ABRAC's chief process development chemist for a number of years before taking up his present post of general works manager. Mr Mason has been with the company since 1938.

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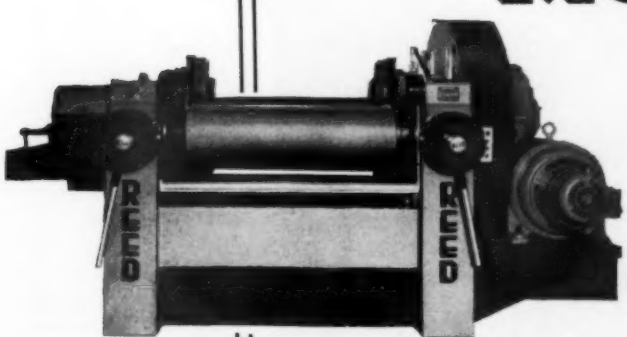

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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Vinyl Chloride–Alkyl Acrylate Interpolymers

No. 821,035. Union Carbide and Carbon Corporation. Application and Filed, April 17 1956. Application in USA, April 18 1955. Published, September 30 1959.

Interpolymers are made by polymerizing a mixture of vinyl chloride and an alkyl acrylate until at least 60% of the total monomers are converted to polymer. The alkyl group of the acrylate contains 6 to 12 carbon atoms and the polymerization mixture contains 1 to 9 parts of vinyl chloride for each part of alkyl acrylate. Polymerization is effected in bulk or in aqueous dispersion.

The interpolymers thus produced are flexible over a wide temperature range without the addition of a plasticizer. The degree of flexibility at room temperature can be varied according to the proportions of the monomers in the polymerization mixture. The interpolymers are useful for preparing flexible films and coated and impregnated fabrics. Interpolymers containing 75 to 85% of vinyl chloride offer a desirable combination of high bending modulus, high tear resistance and outstanding low-temperature toughness which makes them especially suitable for packaging applications. As they are free from plasticizer, there is no risk of plasticizer contamination of food packaged in film made from the interpolymers.

Bonding Rubber to Metal

No. 821,492. United States Rubber Co. Application and Filed, March 21 1958. Application in USA, August 22 1957. Published, October 7 1959.

The adhesion between rubber and a metal body surfaced with zinc is improved by incorporating a small proportion of cobalt naphthenate in the unvulcanized rubber and then vulcanizing the rubber in contact with the metal. The zinc coating need not be pure zinc but may be an alloy containing a substantial proportion of zinc, such as a brass containing at least 10% of zinc, or zinc bronze. Generally, a layer of rubber containing the cobalt naphthenate is applied to the zinc surface of the metal and then the main body of the rubber is applied to this layer and the whole vulcanized. In an example, the process was used for bonding rubber to galvanized steel tyre cord. Test results of the pull required to separate the wire from the rubber showed an approximately five-fold increase in the adhesion by incorporating cobalt naphthenate in a layer of the rubber adjacent to the wire.

Shorter Abstracts

Polythene. 819,810. General Electric Co. Filed, March 29 1956.—Polythene in the form of a film or other product is exposed to high energy electron irradiation at a temperature above 85°C. but below the flow point of polythene. The irradiation causes cross-linking of the polythene and increases its resistance to solvents.

Graft Copolymers. 820,089. General Electric Co. Filed, March 11 1957.—A graft copolymer is prepared by copolymerizing a vinyl aryl compound, *e.g.* styrene, with a rubbery polybutadiene containing at least 30% of 1,2-polybutadiene by heating at a temperature of 60° to 150°C. in the presence of di-α-cumyl peroxide.

Curing PVC Foam. 818,418. Union Carbide Corporation. Filed, April 9 1956.—A process and apparatus are described for curing PVC or other vinyl resin foam by means of radio-frequency heating.

Antioxidants. 820,170. The B. F. Goodrich Co. Filed, March 28 1956.—Bis (3-methyl-4-hydroxy-5-hydrocarbon phenyl) cycloalkanes are claimed as non-staining antioxidants for natural and synthetic rubbers.

Rubber Crop Returns

Unless otherwise indicated the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

RUBBER ESTATE AGENCY

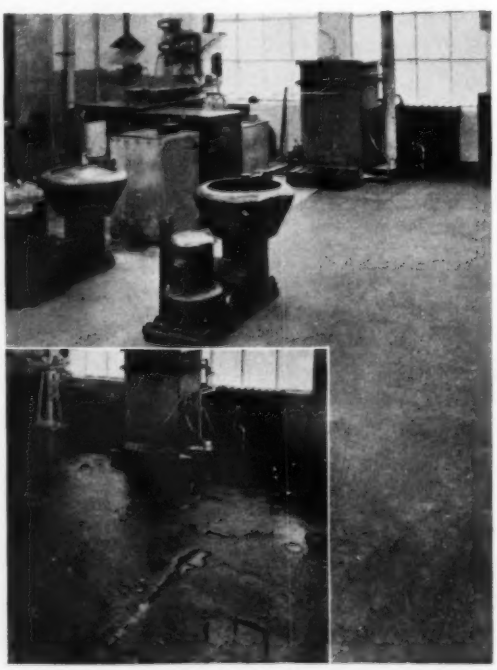
January

Kuala Lumpur.—678 (737). 4 mths—2,764 (2,841).
Jeram.—348 (380). 4 mths—1,347 (1,199).
Tamiang (Malaya).—80 (82). 4 mths—309 (304).
Sungei Kahang.—139 (135). 4 mths—640 (557).
Bandar Sumatra.—90 (121). 6 mths—591 (655).
Batu Kawan.—78 (66). 5 mths—363 (321).
Buntar.—123 (105). 1 mth—123 (105).
Kepitigalla.—85 (71). 10 mths—593 (605).
Langkat Sumatra.—85 (90). 1 mth—85 (90).
Sungei Bahru.—143 (120). 7 mths—956 (779).
Tambira.—121 (104). 7 mths—829 (811).
Tanjong Malim.—347 (401). 7 mths—2,630 (2,567).
Sennah.—207 (143). 1 mth—207 (143).
Amalgamated Rubber.—35 (42). 1 mth—35 (42).
Java Rubber.—92 (93). 1 mth—92 (93).
Soember Ajoe.—17 (28). 4 mths—57 (114).

THOMAS BARLOW

January

Bradwall (FMS).—151 (142)
Chersonese (FMS).—80 (65).
Highlands and Lowlands Para.—2,112 (1,661).
Krian Rubber.—8 (11).
Sungei Krian.—190 (169).
Muar River.—300. 13 mths—3,393 (3,467).



CIBA Araldite epoxy resin was used to relay this factory floor, which was badly pitted from oil saturation and iron-wheel traffic (*see inset*). **The resin was laid to a depth of ¼ in. in small areas so that production was not affected. As this is a suspended floor, this process saved a lot of money—relaying concrete would have meant removing entire bays**

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

IT'S been rather like the old game of 'follow my leader' in stock markets over the past few weeks. What Wall Street has done one day, the London Stock Exchange has followed the next, and with the DOW JONES index dipping at one time to its lowest point since last April, it is easy to understand why trading has remained quiet with investors sticking to a cautious approach.

Another factor which unsettled sentiment a little was the Governor of the Bank of England's warning that 'too much money is chasing too few first-class shares.' Whether or not we are on the threshold of some kind of technical correction is difficult to say at the moment, but we feel that over the next month or so price trends are going to be tested up to the hilt.

The strong revival in British industry as a whole continues, as the January trade figures underlined only too well. UK exports in January soared to a new record level of £316.3m. which is £16m. more than the monthly average for the December quarter of 1959. Because of the need for larger supplies of raw materials to support business expansion plans imports were also higher. Even so the trade 'gap' of £39m. was £10m. less than in January 1959. Further, the recent report from the Federation of British Industries was, to say the least, very encouraging. At the moment, however, it seems a shade doubtful whether these 'bull' points are sufficient to push the market to yet further new records. But with 'blue chips' yielding on average £4% on dividends and £8 16s.% on earnings, there should be a solid enough basis for present levels.

We might also add that the dividend and company news season has only just started to get really under way. If they are generally good—as most of us expect—then they could have a profound effect on buyers' confidence.

'More or less in line with market hopes.' That was the summing-up by our market friends when they heard about the trading results from O. AND M. KLEEMANN, the well-known plastic goods and material makers. The groups profits have gone up from £480,600 to £535,700. This time the tax man takes £208,000, against £168,300 he gobbled up last time. Depreciation charges are lower at £56,000 resulting from the sale of a subsidiary during the year. The £100,000 book loss already reported on the subsidiary's capital has been deducted from general reserve which after the allocation from this year's profits will stand at £250,000.

Shareholders will be pleased with their dividend—going up of course. A final of 22½% brings the total up to 37½% on capital increased by the 2-for-13 'rights' issue. This is a rise of 7½% over the previous effective total which included a special interim.

Shares of ANCHOR CHEMICAL have been a bright spot in front of the dividend announcement, and just to prove

Continued on page 330

Share Price Movements

Par Value	Company	1959-60 High	Low	Feb. 13	Latest
£1	A.E. Ind. Ord.	67/6	53/9	64/-	60/6
5/-	Albright & W. Ord. ..	31/-	13 4½	28/-	28/3
£1	" " " 5% Pref.	18/9	15/4½	16/3	16/10½
5/-	Anchor Chemical Ord...	27/6	10/3	24/6	27/-
5/-	Andersons Rub. Ord. ..	4/6	1/1½	3/1½	3/1½
£1	Angus Geo. Ord. ..	44/6	25/3	43/9	42/6
5/-	Ault & Wiborg Ord. ..	24/-	11/6	21/9	21/10½
£1	Avon India Rubber Ord.	47/6	35/6	41/3	40/-
£1	" " " 6% Pref.	18/6	16/6	17/6	17/6
10/-	Bakelite Ord.	46/3	22/-	45/6	43/9
£1	" 6% Pref. ..	19/6	17/6	18/3	18/3
£1	Baker Perkins Ord. ..	53/9	41/3	51/6	51/-
4/-	Bank Bdg. Rubber Ord.	3/7½	1/6	3/6	3/6
5/-	Boake (A) Roberts Ord.	29/6	12/3	29/-	29/3
£1	" " " 5% Pref.	16/9	13/9	16/3	16/3
4/-	Brammer H. Ord. ..	17/6	9/6	17/6	17/6
10/-	Bridge, David Ord. ..	58/-	24/3	57/6	53/9
5/-	Bright, John Ord. ..	18/9	9/6	17/9	16/6
2/-	Brit. Ind. Plas. Ord. ..	13/6	6/9	13/1½	14/-
2/-	" 10% (tax free) Pref.	4/9	3/-	4/9	4/9
£1	British Xylonite Ord. ..	87/6	46/-	84/-	85/-
£1	" " 5% Pref.	16/9	15/-	16/9	16/9
£1	BICC Ord.	61/-	44/6	57/9	56/-
5/-	BTR Ind. Ord.	13/3	8/1½	12/-	12/6
£1	" " 7½% Pref. ..	24/3	20/9	23/9	23/9
£1	Courtaulds Ord. ..	67/9	20/-	62/3	62/1½
£1	" 5% 1st Pref.	18/9	15/7½	17/3	17/9
£1	" 6% 2nd Pref.	22/6	19/-	20/6	20/6
4/-	Cow, P. B. Ord. ..	8/3	6/6	7/1½	8/3
£1	" " 5% Pref. ..	15/6	12/6	15/6	15/6
1/-	Dannimac Mfg. Ord. ..	11/6	5/2	11/6	11/3
10/-	De La Rue Ord. ..	73/9	42/9	70/-	72/3
£1	" " " 3½% Pref. ..	12/9	10/6	11/10½	11/9
10/-	Distillers Co. Ord. ..	39/6	23/6	36/6	35/-
£1	" " 6% Pref...	23/-	19/6	21/6	21/6
£100	" 5% Conv. Loan	£97	£92	£95½	£96
£100	" 5½% Unsec. Loan	£98½	£90	£94	£94
10/-	Dunlop Rubber Ord. ..	29/9	17/-	25/-	25/1½
£1	" " 5½% Pref.	20/3	16/3	18/3	18/3
£100	" 3½% 1st Debs.	£78	£71½	£77½	£76
£100	" 4½% 2nd Debs.	£88	£80½	£86	£86
£1	Eng. Elect. Ord. ..	61/-	37/9	47/-	47/9
4/-	Ebonite Cont. Ord. ..	15/3	11/-	13/10½	12/6
£1	English China Clays Ord.	94/3	47/-	91/-	91/6
£1	Goodyear Tyre 4% Pref.	13/-	11/9	12/6	12/6
5/-	Greeff Chem. Ord. ..	31/9	15/-	30/-	30/3
10/-	Greeff Chem. 5½% Pref.	8/9	7/6	8/6	8/9
5/-	Hackbridge Hldg. ..	19/9	14/-	16/-	16/-
4/-	Greengate & Irwell Ord.	7/-	4/-	5/9	5/9
£1	Harrisons & Crosfield Dd.	64/-	30/9	57/-	56/3
1/-	Hunt & Moscrop Ord...	2/6	1/1½	2/1½	2/1½
£1	Imp. Chem. Ord. ..	62/6	32/9	58/6	57/10½
£1	" " 5% Pref. ..	19/-	15/6	17/7½	17/9
£100	" 4½% Unsec. Loan	£90½	£84	£87	£88
£100	" 5½% Conv. Loan	£196½	£178	£180	£178
1/-	Kleemann (O. & M.) Ord.	10/3	4/3	9/4½	9/9
£1	" " 6½% Pref.	19/-	14/-	18/3	18/1½
2/-	Lacrinoid Prod. Ord. ..	4/3	1/5½	4/-	3/3
5/-	Laporte Ind. Ord. ..	31/-	19/3	27/4½	25/6
£1	" " 7½% Pref.	24/3	21/10½	23/9	23/9
£1	Leyland & Birm. Rubber Ord.	59/-	39/9	52/-	52/6
£1	" " " 6% Pref.	19/-	17/-	17/6	18/9
2/-	London Rubber.. ..	14/9	6/3	13/-	12/9
£1	" 6% Red. Cum. Pref.	20/-	16/3	18/9	18/9
£1	McKechnie Bros. Ord...	71/3	39/3	68/9	66/3
£1	" " 'A' Ord.	67/6	38/9	66/-	65/-
£1	" " 6% Cum. Pref.	17/-	16/-	17/-	17/-
5/-	Monsanto Chem. Ord...	27/9	14/9	24/1½	24/-
£1	" " 3½% Pref.	13/6	12/-	12/6	12/6
£100	" " 6% Debs.	£104½	£101	£103½	£104
£1	North British Rubber ..	21/3	15/7½	20/6	20/3
5/-	Plastic Enginrs. Ord. ..	26/9	10/3	26/3	26/9
5/-	Redfern Holdings Ord...	7/-	2/6	4/9	4/9
2/-	RFD Ltd. Ord.	6/9	4/-	5/9	6/-
£1	" " 5½% Pref. ..	16/6	12/-	16/3	13/9
2/-	Rubber Imp. Ord. ..	10/9	4/-	6/6	6/7½
2/-	" " 'A' Ord. ..	10/3	3/6	5/6	5/7½
£1	" " 5% 1st Pref.	13/3	10/-	13/3	13/3
5/-	Rubber Reg. Ord. ..	19/-	10/-	18/3	18/3
4/-	Shaw Francis Ord. ..	25/-	13/6	23/9	25/-
2/-	Silentbloc Ord.	13/-	7/6	11/6	11/-
2/-	Sussex Rubber Ord. ..	2/1	1/3	1/7½	1/7½
5/-	Sutcliffe Speak Ord. ..	13/-	6/3	12/6	12/-
£1	Turner & Newall Ord...	113/9	68/6	110/3	111/9
£1	" " " 7% Pref.	25/6	22/6	24/3	24/3
5/-	Universal Asbestos Ord.	43/-	14/3	42/9	41/-
5/-	Viscose Dev. Ord. ..	15/-	9/-	13/9	15/-
5/-	Warne William (Holdgs.) Ord.	19/3	10/9	18/3	18/1½

*Ex-dividend †Ex-capitalization

Rubber Markets

LONDON

Although conditions in the London rubber market have been quiet during the week prices trended higher on a continuation of the recent modest demand. Forward positions are mostly around ¼d. per lb. higher but the Spot is a nominal market and only a shade better on the week.

Latest prices are as follows:

No. 1 RSS Spot: 34d. nominal.

Settlement House:

April 33⅝d.-33¾d.

April/June 33¼d.-33⅜d.

July/September 32⅝d.-32¾d.

October/December 32d.-32¼d.

January/March 31⅝d.-31¾d.

No. 1 RSS cif basis ports:

March 33⅝d.-33¾d.

April 33¼d.-33⅜d.

Godown:

March 115¾ Straits cents nominal.

LATEX

Centrifuged latex per gallon in drums, March, seller 20s. 4d., cif European ports, Spot, 20s. 8d. Bulk, 19s. 8d. Creamed, seller, March, 19s. 10d. Normal, seller, March, 15s. 6d.

AMSTERDAM

The Amsterdam rubber market ruled as under on February 22:

No. 1 RMA	Guilders per kilo Feb. 22	Previous
February	3.25	3.25
March	3.24	3.24
April	3.19	3.18½
May	3.18½	3.18½
June	3.18½	3.18½
April/June	3.19	3.18½

Sales: Nil Tendency: Quiet

BANGKOK

No. 1 RSS

The price for No. 1 RSS, at Bangkok on February 22 was 36.50 (36.50) US cents per lb.

CEYLON

No. 1 RSS

The price for No. 1 RSS Spot, at Colombo on February 22 was 136 Ceylon cents per lb.

SINGAPORE

The market opened about unchanged from the previous closing levels and remained quiet throughout the morning. There was limited interest in lower sheet and sellers were rather inclined to meet the market. The market eased in very light afternoon dealings but covering at the lower levels halted the decline. It then ruled inactive as no interest was developing. After hours, the market was very quiet.

	Malayan cents per lb., fob Malayan ports to open ports Feb. 22	Previous Close
No. 1 RSS, Mar.	114⅞–115¼	115¼–115⅝
Apr.	114⅞–115¼	115¼–115⅝
No. 2 RSS, Mar.	113¾–114¼	114 –114½
No. 3 RSS, Mar.	113 –113⅜	113½–114
No. 4 RSS, Mar.	112¼–113	113¼–113½
No. 5 RSS, Mar.	110 –111	111 –111½
No. 1 Spot ..	114¼–114⅝	114⅜–114⅞
No. 3 blanket, thick remilled, Mar. ..	111½–113½	112 –114
No. 1 fine pale crepe, Mar. ..	131½–133½	132 –133
2x thin brown crepe, Mar. ..	111 –112	111½–112½

Tendency: Very quiet

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums fob at 205.80d. per gallon.

DJAKARTA

No quotations made up to the time of going to press.

NEW YORK

The New York rubber market ruled as under on February 23:

DEALERS' PRICES

	US cents per lb. ex dock Feb. 23	Previous
No. 1 RSS, March	40¼a	39⅞n
April	39⅞a	—
No. 2 RSS, March	40a	39⅞n
April	39⅞a	—
No. 3 RSS, March	40a	39⅝n
April	39⅝a	—
No. 1 RSS, Spot	40¼a	39⅞n
No. 3 Amber blanket crepe, May	39¼b–39½a	—
No. 1 latex thin crepe, March	44⅛b	—
No. 1 latex thick crepe, March ..	42⅛n	—

FUTURES—REX CONTRACT

	US cents per lb. Close	Prev. Close
March ..	39.80b–40.10a	39.80b–39.85a
May ..	39.35t	39.10t
July ..	38.65b–38.75a	38.60b–38.65a
Sept. ..	38.30b–38.40a	38.00b–38.10a
Nov. ..	37.60b–38.00a	37.60b–37.85a
Jan. ..	36.85b–37.00a	37.00a
March ..	36.25n	36.40n

Sales: 19. Tone: Very steady.

Rubber futures were steady in quiet, featureless dealings. Physical rubber was quiet and steady. Little interest from factories or dealers was reported. Futures were very steady in late dealings.

STOCK MARKET

Continued from page 329

that the buyers were right, the directors have sent news that it is going up 2½% to 20%. This has been spiced with a one-for-two share bonus. Profits have improved from £140,400 to £164,400. Out of this a tax bill absorbs £74,900 against £68,000. The report is expected to be issued in the first week in March.

Mr C. H. Glassey, chairman of BRITISH INDUSTRIAL PLASTICS, has reported that an upsurge of business experienced by the group in the latter half of its trading period is continuing in the current year. In the first six months, turnover was lagging a little behind the comparable period for 1957-58. With some reduction in margins the overall results were not encouraging. Subsequent increased demand for products, however, was such that it taxed resources to the limit.

He pointed out that, in order to assess on a long-term basis the future prospects upon which the policy of expansion is being formulated, senior executives have spent an increasing amount of time on overseas visits. An analysis of their reports shows clearly that there is an expanding export market for all the group's products which will supplement the increasing demand at home. To meet growing competition a number of steps to effect economy still further have been taken. These naturally are reflected in increased capital expenditure both realized and projected. In 1958/59 capital expenditure cost around £588,000 and there were year-end commitments of £205,000. Despite this large outlay the aggregate bank balances have only been reduced by some £45,000. It is proposed to create 25 million new 2s. ordinary shares and after the scrip issue there will remain 10,315,554 shares unissued. Apart from not more than 400,000 shares which will be required if an acquisition now being negotiated is completed, there are no proposals for issuing at present any of the balance. But the chairman warns that expansion of activities and the policy pursued of using the most modern and advanced plant and machinery will necessitate considerable outlay in the future. A number of projects are under review and should these be adopted it may be then necessary to issue additional capital.

At a recent special meeting of ALBRIGHT AND WILSON the increase in authorized capital to provide the additional shares required to implement the offers for the A. BOAKE ROBERTS AND CO. (HOLDING) capital was passed. At the same time the permitted number of directors was increased from 12 to 15. It was stated that the proportion of acceptances to date was very satisfactory.

Odd spot: PAKAMAC, the plastics rainwear makers, are shortly to enter the domestic appliance market for the first time with a new refrigerator.

Industry INTELLIGENCE

Technical Data

Viton B

Viton B is a fluoroelastomer with even better thermal stability and resistance to fluids than Viton A and A-HV. In many high-temperature applications, vulcanizates based on Viton B remain usefully elastic for more than twice as long as those based on Viton A. Information on the compounding, processing and vulcanization of Viton B as well as data for the properties of solutions and vulcanizates of this elastomer are given in Du Pont Elastomer Chemicals Department Report No. 59-4, by A. L. Moran, available in the UK from the Du Pont Co. (UK) Ltd., 76 Jermyn Street, London, S.W.1.

Viton B formulations contain the same type of compounding ingredients as are used with the other Viton polymers. Usually this includes a curing agent, a metallic oxide and a filler, while a small amount of plasticizer is used in some compounds. The effect of various metallic oxides, fillers and curing agents on the properties of the vulcanizate are shown. A comparison of Viton A and Viton B in regard to vulcanizate properties is included together with results of exposure of the vulcanizates of the two elastomers to oils, certain strong acids and 30% sodium hydroxide.

Polyurethane Flexible Foams from Daltocel PP1

Daltocel PP1 is a pre-polymer based on a polyether for use in the preparation of polyurethane flexible foam. The foam is produced by reacting Daltocel PP1 with an activator consisting of water and ancillary materials. Urethane Chemicals Literature No. 1 issued by the Dyestuffs Division of Imperial Chemical Industries Ltd. contains information on the properties of Daltocel PP1 and the ancillary materials as well as their use for the production of foam.

The ancillary materials comprise Catalyst SFC, Lubrol SF2 and SF4, and I.C.I. Silicone Fluid F.110/40. A fully compounded activator, Activator SF1, is also available. Details of formulations, with and without the silicone fluid, are given, together with mixing procedure. The foaming reaction begins within a few seconds of mixing the Daltocel PP1 with water and the ancillary materials. On a small scale, *i.e.* up to about 2lb. of material, foams may be made using a batchwise technique, but on account of the speed of the reaction the production of larger-scale mixes necessitates the use of continuous or semi-continuous machines in which the various components are metered to a mixing head from which the liquid passes to a mould. Details of the machinery required can be obtained in the UK from I.C.I. Polyisocyanate Sales Development Dept., Ship Canal House, King Street, Manchester, and overseas from the nearest I.C.I. Sales Office. Data are given in the booklet for the properties of foams made from Daltocel PP1. The foams have excellent resistance to ageing and are equal or superior to other flexible foams under almost all conditions. They darken in sunlight and ultra-violet light but this darkening is not accompanied by any marked deterioration in their physical properties.

OMYA BL18—A White Filler for Polythene

OMYA BL18 is a new white filler produced from an extremely pure crystalline calcite specially treated for use in polythene. The filler is readily incorporated in polythene on a roll mill or in an internal mixer. It can be used in proportions up to 100 parts per 100 parts by weight of polythene and the filled polythene is white or opaque so that it can be coloured as desired. Information on the filler and its use in polythene forms the subject of Technical Bulletin No. 176 available from Croxton and Garry Ltd., 16-18 High Street, Kingston-on-Thames, Surrey.

OMYA BL18 has been submitted to a special treatment which ensures complete dryness of the filler and renders it insensitive to water, thus avoiding any risk of introducing moisture into the polythene. Compared with unfilled polythene, polythene filled with OMYA BL18 shows a reduction in shrinkage, flow and stickiness, as well as an improvement in heat-resistance. Data are given in the bulletin for the properties of a low-density polythene containing 0, 50, 75 and 100 parts of OMYA BL18 per 100 parts of polythene. The filler is equally suitable for use in high-density polythene.

Polysar Latex 722

Polysar Latex 722 is an SBR latex designed primarily for foam rubber manufacture and it offers a number of advantages over Polysar Latex 721. Higher solids with no increase in viscosity, lower non-rubber content, excellent odour and very low coagulum content have been combined with the ability to make foam rubber having improved compression resistance. Polysar Latex 722 is prepared by cold polymerization and freeze-agglomeration. The properties, handling, compounding and applications of this new latex are described in Polysar Technical Report No. 8:11A, distributed in the UK by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4.

Normal latex compounding techniques may be applied to Polysar Latex 722, and alkaline solutions or dispersions of soap, stabilizers, curing ingredients and fillers may be incorporated with mild agitation. For foam rubber, and in other applications where unsupported films must meet specifications for tensile strength and elongation, blends with natural rubber latex should be used. Ratios of natural rubber latex: Polysar Latex 722 up to 25:75 are recommended for foam rubber. Data for compression resistance of natural rubber latex foam and foam made from a 25:75 blend of natural rubber latex and Polysar Latex 722, show that the blend has a compression resistance of the order of 10% higher than that of the natural rubber latex foam. In addition to foam rubber, Polysar Latex 722 is recommended for use in water-based adhesives for textiles, paper and leather, in carpet and upholstery backings, and in rubberized asphalt.

New Publications

Asbestos Millboard

Asbestos millboard is useful in applications where flame and heat-resistance are essential properties. Turner Brothers of Rochdale have now issued an illustrated brochure on this board, which is manufactured in a similar way to cardboard and paper. Standard sizes and hardnesses are quoted, and some of the applications given are: in the manufacture of catering equipment, furnaces, boilerhouse floor underlay, and as a thermal lining in hatching incubators.

Natural Rubber News

The February issue of this publication of the US Natural Rubber Bureau examines the American car market, since three-quarters of all rubber used in the USA goes into automobile products, and produces figures to show that while home sales have gone up, exports are falling and are giving rise to serious concern.

The bulletin also discusses the general business climate and gives statistics of supply and distribution of natural and synthetic.

Chemicals Catalogue

A new way of issuing check lists of general chemical products is made by Albright and Wilson (Mfg.) Ltd. in a revised list of the products that are handled by their general chemicals department, published this month.

The new catalogue, which has been well designed for quick reference, lists over 350 regular products that are handled by the general chemicals department of the company. These general and fine chemicals are detailed in alphabetical order; a brief description of their physical form and the available packaging is useful additional information.

Future Events

INSTITUTION OF THE RUBBER INDUSTRY

Burton-on-Trent Section.— Monday March 7 at the Midland Hotel, Burton-on-Trent, at 7.30 p.m. Panel on 'Processing and Processing Machinery.' K. M. Wilson, A.M.C.T., A.M.I.Mech.E. (David Bridge and Co. Ltd.).

London Section.—Tuesday March 1 at the Wellcome Foundation, 183 Euston Road, N.W.1. 'Recent Investigations into Polymer Degradation,' by Dr N. Grassie (Glasgow University). In conjunction with the PI.

Merseyside Section. — Saturday March 5. Dinner dance at Reeces, Parker Street, Liverpool.

North-Eastern Section. — Monday March 7 at the Eldon Grill, Grey Street, Newcastle, at 7 p.m. 'Rubber and Sport'—a series of films from the Dunlop Rubber Co., will be shown.

South Wales and Monmouth Section. —Monday March 7 at the Wyndham Hotel, Bridgend, at 7.30 p.m. 'Millrooms, Mastication and Mixing,' by T. J. Daniel, B.Sc. (RABRM).

PLASTICS INSTITUTE

London Section.—Tuesday March 1 at the Wellcome Building, 183-193 Euston Road, N.W.1, at 6.30 p.m. 'Recent Investigations into Polymer Degradation,' by Dr N. Grassie (Glasgow University). In conjunction with the IRI.

Midlands Section.—Monday March 7 at the Grand Hotel, Leicester, at 6.45 p.m. 'Recent Development in Vacuum Forming Techniques,' by A. M. Craig (I.C.I.).

Southern Section.—Thursday March 3 at the Chemistry Department, Southampton University, at 7.30 p.m. 'Polycarbonates,' by a member of Farbenfabriken Bayer A.G.

SCI Plastics and Polymer Group.— Tuesday March 1 at the SCI meeting room, 14 Belgrave Square, S.W.1, at 6.30 p.m. 'Some New Aspects of the Crystallization of High Polymers,' by Dr A. Keller (Bristol University).

Company in the News

New Expandite Subsidiary

Expandite Adhesives has been formed as an Expandite subsidiary to manufacture and market a range of adhesives. The main emphasis will be on adhesives for the building, civil engineering, metal fabrication and assembly industries.

The directors are: Mr T. Pooley (chairman), Mr G. Bussey (managing director), Mr A. Cathcart, and Dr J. Bowler Reed. The secretary is Mr J. W. Bolton.

The company will operate from St. Helens, Lancashire.

John V. Bjacek has become managing director of the footwear division of the South India Rubber Works. The Indian firm is an affiliate of Ro-Search.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

(795,031) Synthetic resins in the form of liquids, pastes, emulsions, dispersions, powders, pellets and granulates, being goods for use in manufacture. Also 795,035: Synthetic resin plastics included in Class 17 in the form of sheets, foils, films, rods, tubes, blocks, strips and shaped pieces. Imperial Chemical Industries Ltd. Millbank, London, S.W.1. (Class 1; January 12 1960).

RILTEX (794,567) All goods included in Class 17. Rubber Improvement Ltd., Rilex House, 2 Chandos Street, London, W.1. (Class 17; January 12 1960).

VERYVINYL (781,139) Articles included in Class 19 made wholly or substantially wholly of vinyl plastics. Also 781,138: Vinyl plastics in the form of sheets, rods, tubes and shaped sections, and articles made therefrom, all included in Class 17. Limhamns Traindustri Aktiebolag, 14 Rundelsgatan, Malmo, Sweden. Address for service is c/o Lewis W. Goold and Co., 5 Corporation Street, Birmingham 2. (Class 19; January 19 1960).

HYFIX (B788,787) Materials made of rubber or of plastics included in Class 17 and being in the form of sheets, strips, rods, bars or blocks, and all having an adhesive surface or surfaces. The Scholl Mfg. Co. Ltd., 182-204 St. John Street, Clerkenwell, London, E.C.1. (Class 17; January 19 1960).

NEW COMPANIES

Cirencester Plastics Ltd. (648,646).—February 4. Capital: £2,000 in £1 shares. The first directors are to be appointed. Regd. office: Kent End Cottage, Ashton Keynes, Swindon.

Expanded Polystyrene Machinery Ltd. (648,708).—February 4. Capital: £500 in £1 shares. Objects: To design and manufacture all kinds of equipment used in processing expanded polystyrene, etc. The directors are: Bryan Shipley and Marie E. Shipley, both of The Garland, Farnborough Road, Farnborough. Regd. office: 1-2 Milk Street, Cheapside, E.C.2.

Walton Plastics Ltd. (648,630).—February 3. Capital: £1,000 in £1 shares. The first directors are to be appointed. Regd. office: 46 Market Place, Reading.

Nylon Components Ltd. (648,446).—February 1. Capital: £1,000 in £1 shares. Objects: To carry on the business of mechanical and general engineers. Power is taken to carry on the business of nylon, plastic, metal and wooden goods manufacturers, etc. The directors are: Michael Sadler and Mrs. Denise M. M. Sadler, both of "The Birches," Abbotsbrook, Bourne End, Bucks.; Maurice Sheppard, 3 High Street, Maidenhead. Solicitors: Willmett and Co., Maidenhead.

Whitehouse Flexible Tubing Ltd. (648,574).—February 2. Capital: £300 in £1 shares. To carry on the business of flexible tubing manufacturers, etc. The permanent directors are: John M. Whitehouse, Buckley Green Farm, Henley in Arden; Alan J. Whitehouse, Dunstall Court, Feckenham, Worcester; Norman Whitehouse. Regd. office: 11 Barford Street, Birmingham 5.

G.E.G. Plastics Ltd. (649,086).—February 9. Capital: £1,000 in £1 shares. The directors are: George E. C. Gillett, 1 Scallows Close, Three Bridges, Crawley, Sussex; Arthur R. Lester, 13 Holberry House, Kingswood Estate, S.E.21; Thomas W. Standivan, Derek G. French, Gordon H. Matzen and George H. Pickett. Regd. office: 16 Milkwood Road, Herne Hill, S.E.24.

Plastic Hollow-Ware Ltd. (649,154).—February 10. Capital: £2,000 in £1 shares. The first directors are to be appointed. Regd. office: 62 Regent Road, Kirkdale, Liverpool.

ALL BULL. Black Angus bull moulded in Tenite acetate butyrate and marketed by Breyer Molding Co., Chicago

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationery Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on February 24 1960

British Rubber Producers' Research Association. Production of rubber-polymer mixtures and compounds. 828,895.

Imperial Chemical Industries Ltd. Polymerization. 828,894.

Dunlop Rubber Co. Ltd. Production of foam rubber. 828,899.

Distillers Co. Ltd. Polymerization of ethylene. 829,098.

Dunlop Rubber Co. Ltd. Micro-porous separators for electric storage batteries or accumulators. 828,683.

E. K. Cole, B. E. Terry and A. B. Glanvill. Moulding of thermoplastic articles. 828,685.

Montecatini Soc. Generale Per L'Industria Mineraria E Chimica and K. Ziegler. Method of selectively polymerizing α-olefins. 828,791.

E. I. Du Pont De Nemours and Co. Purification of olefin polymers. 828,690.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius, and Brüning. Process for the manufacture of polythene of high molecular weight. 828,692.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius, and Brüning. Process of shaped articles composed of high-melting polymers containing ester groups in the chain. 828,903.

Increases of Capital

Precision Plastics Ltd. (330,759), 102 Colmore Row, Birmingham.—Increased by £55,000 in £1 unclassified shares, beyond the registered capital of £20,000.

Victor's Continental Plastics Ltd. (584,473), 53 Queen Anne Street, W.1.—Increased by £10,000 in £1 "A" ordinary shares, beyond the registered capital of £10,000.

A. Tout and Sons Ltd. (370,394), manufacturers of and dealers in rubber soles and heels, etc., New Mills, Idle, Bradford. —Increased by £5,000 in £1 shares, beyond the registered capital of £10,000.

Changes of Name

Peradin and Watercraft Ltd. (428,556), Freshford, near Bath, Somerset.—Name changed to Peradin Rubber Co. Ltd.

Victor Grant Plastics Co. Ltd. (584,473), 53 Queen Anne Street, W.1.—Name changed to Victor's Continental Plastics Ltd.

R·J·I·P· CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

ADHESIVE specialist required by footwear manufacturer for research and development work. Applicants, who should be free of National Service obligations, have the opportunity of a well paid and progressive appointment. Assistance given with housing. Contributory pension scheme.—Write giving full particulars of age, experience and salary required to Box 93. (93)

A RESEARCH chemist and a production chemist are required for the development and manufacture of polyurethane foams. Some previous knowledge and experience in this field would be preferred but all applications for these two positions will be considered. An attractive salary is offered with a rapidly expanding company. Replies in confidence to:—Aeropreen Products Limited, Lindsay Avenue, High Wycombe, Bucks. (82)

ASSISTANT rubber technologist, L.I.R.I., production experience of footwear compounds. Excellent prospects.—Sam Kay Rubber Co. Ltd., Hope Mill, Portwood Place, Stockport, Cheshire. (31)

A RUBBER chemist or applicant suitable to train required by rubber manufacturers situated near Manchester. Candidates should be between 20 and 30, must have H.N.C. and A.I.R.I. qualifications. Every opportunity for advancement both in remuneration and status. Contributory pension scheme. Write giving age, qualifications and particulars of previous appointments with dates to Managing Director.—Box 69. (69)

ESTIMATOR with experience in rubber industry is required to fill vacancy arising due to promotions. A young man with knowledge of general mouldings and mechanicals would be preferred. The company operates four factories in the United Kingdom and the successful applicant would be based at head office near London.—Apply stating age, experience, qualifications and salary required to Box 105. (105)

SENIOR RUBBER TECHNOLOGISTS

required for an expanding

RESEARCH AND DEVELOPMENT CENTRE

in

MIDLANDS

for interesting work in wide range of activities. Candidates will probably be aged 27 to 40, with A.I.R.I. and/or A.P.I., A.R.I.C., B.Sc., etc., also some experience in one or more of the following fields:—

ADHESIVES
BONDING OF RUBBER TO METAL AND OTHER MATERIALS
CONVEYOR and/or TRANSMISSION BELTING
HOSE
INFLATABLE EQUIPMENT
MOULDED MECHANICALS

Such men, who consider themselves worthy of excellent prospects with a commencing salary in region of £1,200 p.a. should send full education and career details to Box 38. (38)

APPOINTMENTS VACANT

(continued)

RUBBER CHEMIST

Gutta Percha and Rubber Limited, Toronto, Canada, manufacturing belts, hose, tread rubber, sheet packing, rotocure products, etc., desires a chemist with a minimum of 3 years' compounding experience. Background of processing in belt and hose production highly desirable. Salary $5,000 to $7,200 depending upon experience.

Reply in first instance to.—Mr. L. Andrews, Lionel Andrews Rubber Co. Ltd., Albion Works, Balfe Street, King's Cross, London, N.1. (104)

FACTORY in the South of England requires experimental technical assistant to assist in developing and taking charge of expanding laboratory. Must have working knowledge of factory and laboratory workshop practices to help develop new, and improved existing processes. Not over 40 years.—Apply in writing to Technical Manager stating in confidence present position, salary, age, qualifications and experience.—Box 100 (100)

FIRST-CLASS rubber chemist for laboratory in substantial Northampton works, producing wide variety of mouldings and extrusions. Replies in confidence with full details of experience.—Box 108. (108)

GENERAL foreman required for small rubber factory situated London/Essex border. Thorough knowledge open mill mixing, moulded mechanicals, extrusions, etc. Excellent opportunities for right man. Pension scheme.—Box 71. (71)

INDUSTRIAL eye protection specialist required. Must be capable of equipping factory. Organize and control production. Be conversant with technicalities of this work, together with comprehensive knowledge of marketing. Excellent prospects for right man. All replies treated in strict confidence.—Box 107. (107)

RATE fixer required. A progressive rubber company in the South Midlands has a vacancy for a rate fixer with experience in the rubber industry.—Write for application forms to Box 106. (106)

NATIONAL COLLEGE OF RUBBER TECHNOLOGY

Holloway Road, London, N.7.

A course on

PROCESSING AND PROPERTIES OF STYRENE - BUTADIENE RUBBERS

A two-day course commencing on Monday, April 4, 1960, consisting entirely of practical work aimed at showing how to achieve best results with today's grades of SBR.

This course is suitable for men and women with some knowledge of processing procedures, who wish to become more closely acquainted with the techniques of processing these attractively priced and increasingly popular synthetic rubbers.

Further details may be obtained from the Head of the College. (102)

APPOINTMENTS VACANT

(continued)

RUBBER technologist/chemist required as direct assistant to chief chemist, by progressive company engaged in press moulding and extrusion of components for very wide industrial applications. Several years' technical experience with natural and all synthetic rubbers is desirable. Ample scope and attractive salary for suitable applicant and assistance with housing if required.—Box 94. (94)

RUBBER technologist required. Young man L.I.R.I. or A.I.R.I. standard, preferably with some works or laboratory experience, capable of taking some responsibility. Physicist required by progressive company. Young man with B.Ss. or equivalent standard, preferably with some experience in the rubber industry and capable of taking some responsibility. Good opportunity with progressive company.—Apply, stating age and experience, to Andre Rubber Co. Ltd., Kingston By-Pass, Surbiton, Surrey. (96)

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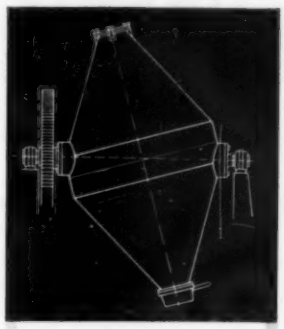

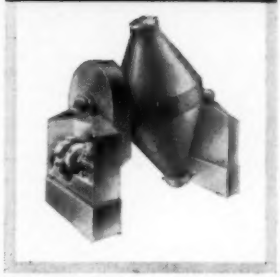

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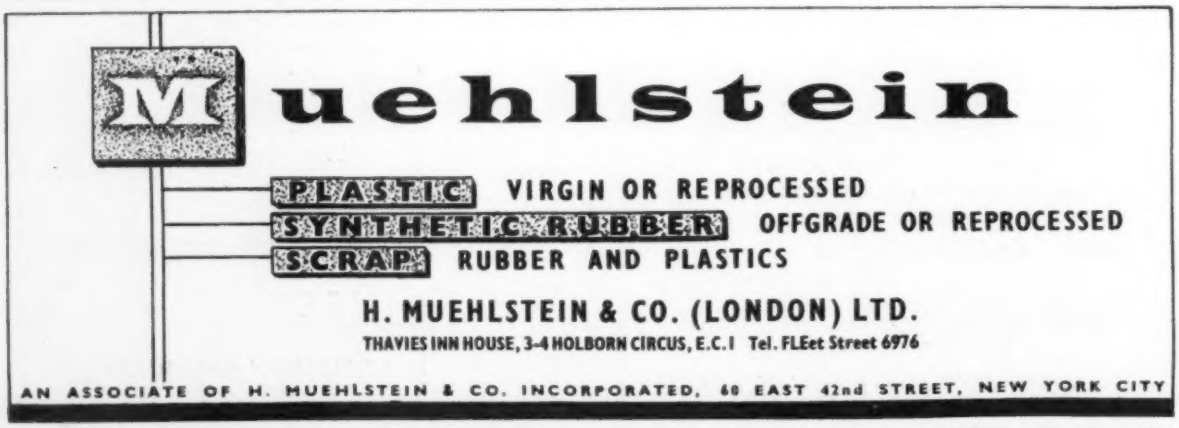
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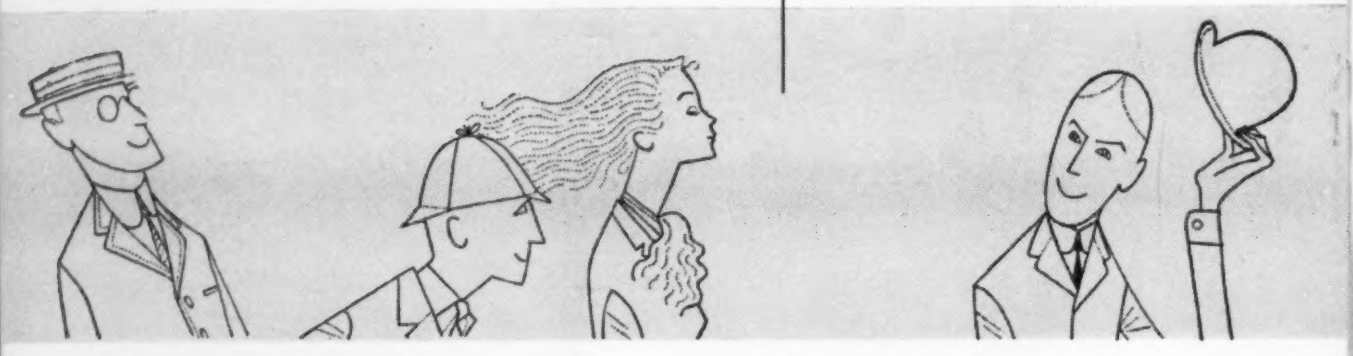

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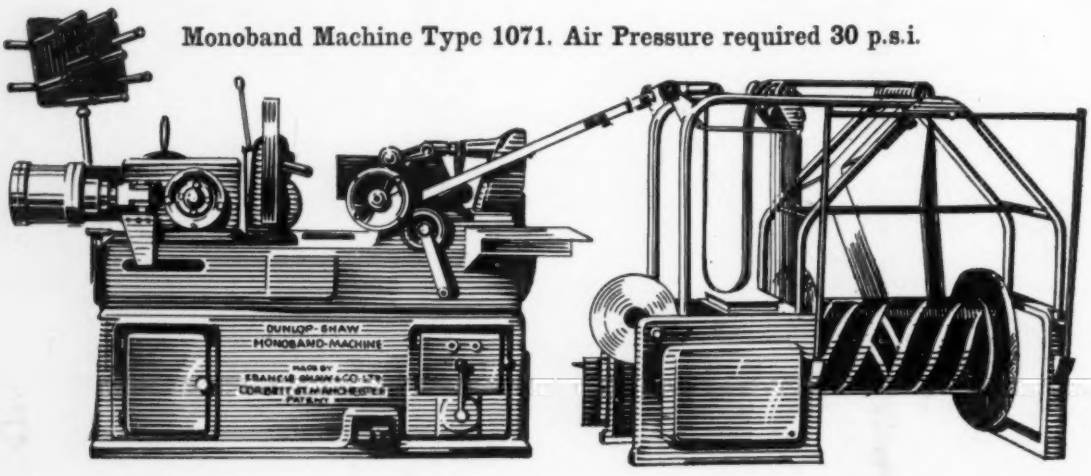

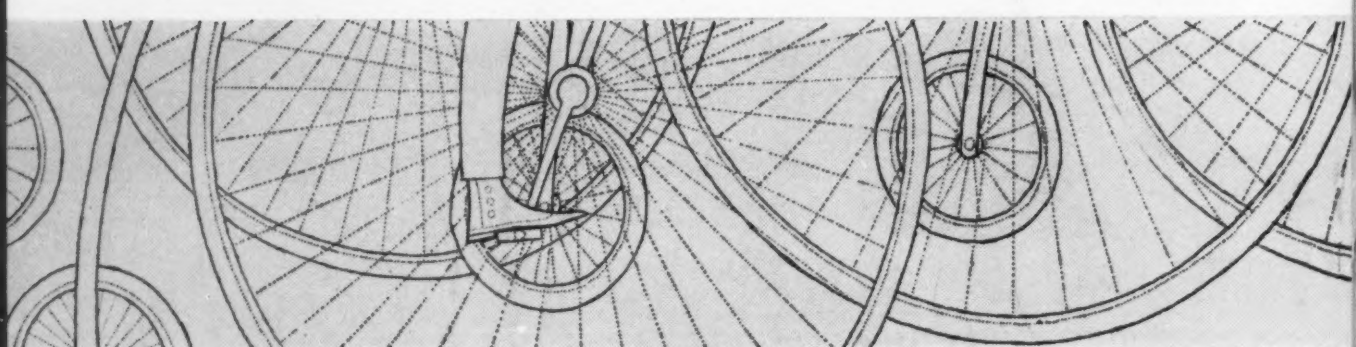

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